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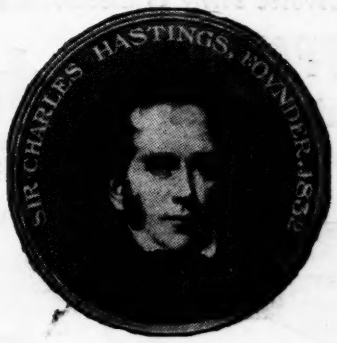

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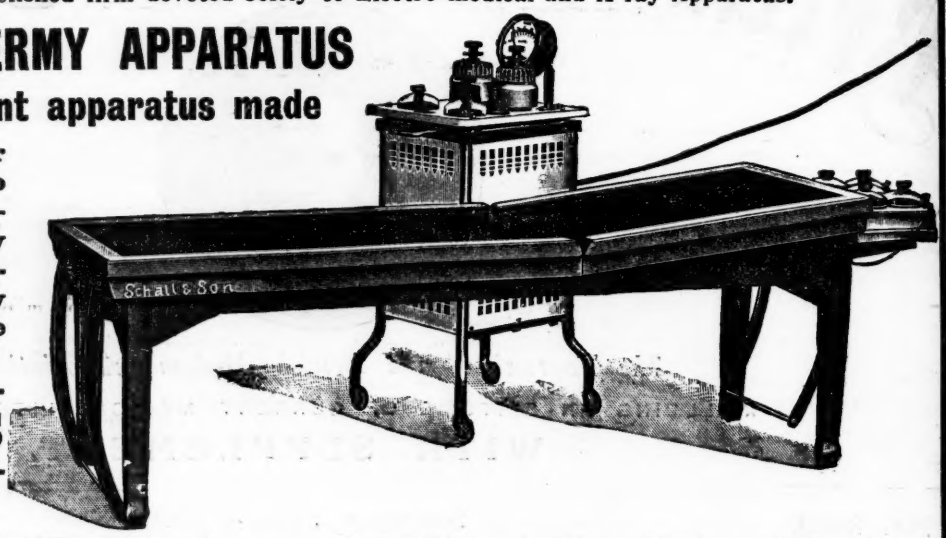

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A Defence of the Thesis

THAT

"THE OPPORTUNITIES OF THE GENERAL PRACTITIONER ARE ESSENTIAL FOR THE INVESTIGATION OF DISEASE AND THE PROGRESS OF MEDICINE."*

BY

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Introduction.

My object is to demonstrate that the conception of medical research which is dominant to-day is so immature and imperfect that it renders fruitless much of the research work. Indeed, so imperfect is the conception that fields essential to medical progress are not recognized. It is well, therefore, that men engaged in medical research should at intervals pause and consider what they are doing, so that they clearly realize the object of their endeavour and be certain that their methods are suited to their purpose. Never in the history of medicine has there been such activity as now, and there never was a time when it was more necessary to have a clear perception of aims and methods, especially as great schemes are being launched in legislature, in research, and in education. If these schemes be based upon immature experience and imperfect knowledge, the progress of medicine may be hampered for generations.

We are all the creatures of circumstance, and our ideas are moulded by our experiences. Those employed in the study of medicine look at the subject in the light of their own experiences. As the subject is so large, one individual can have an experience of but a small part, so that there is no one capable of seeing it as a whole. The result is that medicine has to be studied in sections, and this leads to specialism. The authorities who guide and direct the progress of medicine are therefore men with but a limited experience, and this leads to a limited outlook. In an attempt to bring together a body of men whose united experience, it might be thought, would cover the whole field, there is a danger that some section may be wanting, and thus a distorted view or a view lacking in perspective may be obtained.

A review of medical progress reveals the fact that medicine is emerging, slowly and hesitatingly, from a past burdened by tradition and even superstition. The conception of what constitutes medical science is still so imperfect that no clear understanding exists on what lines it should be pursued. While the aim of medicine may be recognized, the methods by which this aim may be achieved are not yet understood, and this lack of understanding is leading medicine astray.

In dealing with the clinical aspects of research, and particularly with the opportunities of the general practitioner, I must dwell upon the limitations of laboratory methods, and I may seem to belittle their importance. This is far from my intention. No one recognizes the importance of laboratory methods more than I do, and probably no clinical observer has received greater help from them. Indeed, I consider that I have a better appreciation of their methods than many who indiscriminately belaud them. My experience not only enables me to appreciate their value, but also to recognize their limitations.

Successful Methods in Research.

Let us briefly look at one aspect of the subject by considering where medical research has been successful. The highest aim of all research is the prevention of disease. If we take the instances where this aim has been achieved we find a uniform method of procedure. In every case the clinical observer, by the exercise of his peculiar methods, took the first step. He recognized in the sick man the signs of disease, he differentiated these signs in such a manner that he was able to recognize separate forms of disease. He recognized these signs at such an early period that he detected the circumstances that favoured or induced the disease. He was then able to take steps to prevent the disease. Such is the history of the prevention of such diseases as typhoid fever, syphilis, rabies. At other times he has not been able to carry the investigation so far, and recognizing his limitations he handed the subject over to the laboratory worker, as in malaria and allied diseases.

Such in brief is the method which common sense tells us should be followed in the case of every disease, but where is the clinical observer to be found to-day?

A foolish idea has arisen that the methods by which he made his contributions to research are so easily understood that they need little consideration, and so easily recognized that they need no special investigation, and that their possibilities are exhausted. There never was a greater fallacy. We know that it takes many years before a man becomes trained in bacteriological technique. It requires a much longer time to train a man to recognize the early symptoms of disease. It takes many years of experience to put intelligent questions to the patient, and more years of experience to enable the replies to be interpreted.

The part which the clinical observer should play in medical research is to-day not recognized, and there follows as a consequence an insurmountable obstacle to attaining the chief aim in medicine—the prevention of disease. If you do not recognize the early symptoms of disease you can never recognize the circumstances that favour or cause its onset. This to me is such plain common sense, that it is one continual source of wonder that our authorities fail to see it.

Once this is seen, the next question is, Who is the man that has the opportunity for seeing the early stages of disease, and the circumstances that favour its onset? There is only one person, and that is the general practitioner.

The Diseases Common among the People.

When we started our enterprise at St. Andrews, we reflected that if success were to attend our efforts we must clearly perceive what we were aiming at. Our chief aim was the prevention of diseases which are common among the people of the country.

The question arose "What are those diseases?" Seeing that we have now a Ministry of Health one would naturally expect that this knowledge would be in its possession. Seeing also that doctors are being educated to combat these diseases, it might have been expected that educational authorities would know. But a brief inquiry revealed the fact that this knowledge does not exist.

The reason for the absence of a knowledge so essential to intelligent law-making, education, and research, is that it can only be obtained by the general practitioner, and no one ever thinks of asking him to undertake any inquiry.

We therefore started an inquiry into this matter, and met unexpected difficulties. However, we got an insight into the matter that revealed defects in medical knowledge so great that they more than justified our undertaking.

One fact that came out clearly was that the impression that great progress had been made in recent years was scarcely justified, so far as the recognition and prevention of disease was concerned. We found that discoveries of the origins of common diseases were so few during the past fifty years that we had difficulty in recognizing any advance. A little consideration revealed the reason.

The Progress of Medicine during the Past Century.

A hundred years ago we can trace medicine following two distinct paths: There was the clinical school, mainly British, in which the chief instrument was the clinical observer with his trained senses and his mind stored with the fruits of his past experience. There was the growing laboratory school, mainly Continental in its origin, which received a great impetus when Virchow introduced the theory of cellular pathology. Up to fifty years ago the trained observer was slowly unravelling the early symptoms of disease, discovering the beginnings of disease and their cause. With the increase of knowledge of the structure of the body and of the modifications produced by disease, and by improved laboratory technique, pathology gradually came into prominence. The dead-house became the centre of great activity. The accurate observation of diseased organs revealed on the *post-mortem* table led the

* Being a lecture delivered at St. Mary's Hospital, in the Institute of Pathology and Research, during the course on Pathological Research in its Relation to Medicine.

physician to seek in the living the evidences of these diseased organs, and thus was laid the foundations of that physical diagnosis which we know to-day. The seeming sufficiency of this method of study led to a classification of disease based upon the morbid appearances of the organs, a classification which survives and influences teaching to-day.

There is a delusive precision in this classification which has had a pernicious effect on medicine as a whole. It may be true of disease as seen from the dead-house point of view; it may be partly true of disease as seen from the point of view of the medical and surgical wards, but it is so little true as to be misleading when looked at from the point of view of the general practitioner. It is misleading because it deals only with end-results, a totally different matter from the early stages of disease. These end-results may be the diseases imposed upon a constitution already enfeebled, or the outcome of a process whose symptoms in the early stages have never been recognized. One outcome of this classification has been to rivet the search on those signs which occur only in advanced states of disease—when, that is to say, damaged tissues produce a physical sign. So powerful has this influence been that attention is now concentrated on the search for improved methods by which these physical signs can be revealed. So many methods have been discovered that men have to devote themselves to special branches, and we see the result in the specialism of to-day. It seems not to have been grasped that the specialist can only recognize disease after it has gone so far as to damage the organs, and no specialist ever sees the early stages of the disease in which he specializes.

Following upon the introduction of more accurate pathological investigation came the microbic theory of disease, with its startling revelations and successes. The imagination of the medical world was fired, and the most exaggerated expectations were formed of what it could do, and thus it practically superseded all other methods of investigation, and speedily attained that dominant position which it holds to-day. Following in its track came the introduction of the methods of other sciences, and there arose that conception of medicine which looks to the laboratory as the only sphere of progress. As a result the methods of the clinical observer by which so much had been achieved fell to the background, and as an investigator he gradually disappeared. This was a calamity, and the more so that neither the part he should play or the opportunities which he possesses are understood.

Movements in Circles.

Between the town of Burnley and the village of Haworth, where Charlotte Brontë lived, there stretches a wide moor. Some of my friends started one day to walk from Burnley to Haworth. About an hour after they started a heavy mist fell and they lost their way. They happened on a shepherd's cottage and the shepherd gave them their directions. In three hours they were back again at the cottage, having wandered in a circle. This well-known tendency to walk in a circle is a human peculiarity that affects not only bodily movements but mental. History shows civilizations that arise, make a little progress, then make no further progress, but move round and round and gradually relapse. Religions, too, can show the same process. This kind of arrested development affects individuals, for we all know how many young men start out in life with every prospect of going far, and after middle age are found muttering the shibboleths of their youth.

There are signs that this tendency hampers medical progress, and much of what we assume to be progress is but moving in a circle, and results which are taken as signs of progress often but add to the fog which obscures the way.

PROGNOSIS.

I do not develop this theme to-day, but my purpose is to direct your attention to a subject which illustrates this point of view. I choose one with which you all are familiar—indeed many may think it so well known that it needs no consideration. It is, moreover, a subject which acts as a guide to progress, a beacon in the fog, and at the same time provides the means by which progress or the reverse can be judged. Moreover, it is a subject of the very first importance to the intelligent practice of medicine; but I do not know how to present it in a manner that will convey to you its significance so as to carry conviction.

When a true insight is obtained into what medical science means it will be found that the great obstacle to progress is a lack of understanding of prognosis. Up to thirty or forty years ago the subject was making progress slowly and crudely but definitely. During the last quarter of a century it has got such a set-back that to-day its importance is not understood, the principle which should guide to its knowledge is not appreciated, and the individual whose opportunities afford the means of acquiring this knowledge is not recognized.

I have repeatedly discussed this matter with various authorities in different departments of medicine, and nowhere can I get anyone to appreciate its real nature. The newly qualified doctor is as oblivious to its importance as the matured physician who has for twenty or thirty years been engaged in life insurance examinations, in which it is currently assumed that a prognosis is necessary.

If one wanted evidence of the complete misconception of this subject, it is the practice of appointing laboratory trained men to teach clinical medicine, and the assumption that as soon as a man is qualified he is capable to examine recruits for the army and navy and candidates for life insurance. If I can get you to understand the meaning of prognosis, the futility of these procedures will be apparent to you.

The Importance of Prognosis.

In medical practice one question arises incessantly and persistently, implied or expressly demanded of the doctor, and that question is, "What is to be the outcome of my complaint?" The patient or his friends want to know if the illness is temporary or is it to result in ill health or in death. Then other questions arise, Are there remedies for this complaint, and what are they?

To answer these questions requires a knowledge of prognosis, and one of the cherished beliefs of the public is that doctors possess that knowledge. Moreover, common sense tells us that the public is perfectly justified in expecting from the doctor a knowledge so manifestly essential to the intelligent practice of medicine.

The Peasant and Prognosis.

I was presenting these views once to a very capable general practitioner who had had a distinguished university career. He cordially agreed, and described an incident which forced on him the importance of prognosis, when he entered upon practice. A few days after starting as an assistant to a general practitioner he was called to see a sick ploughman. He examined him and diagnosed a pleurisy. Pleased with his diagnosis, he, in learned fashion, informed the man's wife. She replied, "Aye, but when is my man to be fit for his work?" My friend was taken aback—during the whole of his education he had never been taught to realize that such a question should be asked, and he could not himself answer what he recognized to be a most natural question. I have little hesitation in saying that this poor peasant woman had instinctively a better realization of the requirements of medical practice than the authorities to-day who direct medical education and research.

Let me give some instances illustrating this peculiar defect in medical knowledge.

Recruiting and Prognosis.

Of the vast importance of prognosis and of the disastrous effects of a lack of knowledge of this subject we have had during the war striking evidence. When at a time of great national stress a call was made for men to join the army, it was assumed by the nation, as well as by the military medical authorities, that there existed sufficient knowledge to separate the fit from the unfit. This was really a test on the greatest scale of the adequacy of medical knowledge. At the outset the knowledge was found wanting, for large numbers of perfectly healthy men were rejected, because they presented signs whose value the medical examiners were unable to assess. Later, when the national strain became greater, and it was necessary that even those with impaired health should enter military service, the military authorities again thought they possessed the knowledge necessary to say what amount of physical effort a man was fitted for. It is unnecessary to dwell upon the complete

failure that resulted. So glaring were the mistakes, so unjust were the decisions, that the whole nation was aroused and Parliament was forced to intervene. If there was ever a need for inquiry, here was one; yet the whole matter is brushed aside as if it had never occurred, and medicine has fallen back into its old ways. This illustration shows how backward is the state of medicine when the authorities who direct it are incapable of realizing a defect even when their best endeavours end in a miserable failure.

Prognosis in Surgical Practice.

Another aspect of the subject is shown in surgical practice. If we take a common complaint like appendicitis, there are certain signs which are held to indicate the presence of this disease. The question arises whether these signs indicate a condition which will endanger the patient's life. In other words, what is the prognostic significance of the signs? The question is one of prime importance to the patient, for it may be a matter of saving his life if the danger is recognized and removed; on the other hand, it may be putting the patient in danger by an unnecessary operation—danger to life or of permanent damage to his health.

Many a patient has had his appendix removed when there was nothing the matter with it. Everyone recognizes that appendicitis does occur, and, if not operated on, death may result. The attitude of the surgeon to-day is that, seeing that there is danger, and seeing that surgical knowledge cannot discriminate between the cases where there is danger and those where there is no danger, it is safer to operate. It is the same in the surgical treatment of gastric ulcer. I have seen patients greatly benefited by the operation; I have seen some made worse by the operation, and I have seen patients die in consequence of the operation. These results are due to an absence of a knowledge of prognosis.

Prognosis and Vaccine Therapy.

The development of the bacteriological branch of medicine has resulted in the introduction of new forms of treatment by serums and vaccines. When a person is ill, and a microbe is the suspected cause, the appropriate treatment is to combat this microbe by a vaccine. But here arises the question, Is the patient likely to recover without treatment? If so, then the treatment is unnecessary. If the patient is in danger of death, wherein lies the danger—is it due to that microbe or to other complications?

This is not quibbling, but is essential to intelligent treatment. For instance, I have heard it seriously proposed to find the microbe of measles, and then to get a vaccine to give to patients afflicted with measles, because many people are supposed to die of measles. But the question arises, Do they die of measles? During my twenty-eight years in practice I saw numerous epidemics of measles, and only two patients died; but these did not die of measles but of complications—laryngitis and bronchopneumonia—brought on through injudicious exposure. If due care be taken, why give the vaccine? Unless the source of danger is recognized and provided against, the treatment by vaccines becomes rule of thumb, and is but a reversion to the empiricism of bygone times.

If treatment is to be intelligent, or even scientific, a prognosis is absolutely essential, yet in some recent textbooks on surgery and vaccine therapy I do not find the word prognosis mentioned.

Prognosis in Treatment by Digitalis.

Did time permit I could illustrate in many ways how essential prognosis is to scientific treatment. Let me give one example. For more than one hundred years it has been recognized that digitalis had a beneficial action in certain forms of heart disease, but no definite knowledge existed as to the kind of heart disease which benefited, so that every person supposed to have a heart affection was given digitalis. Careful investigation has revealed that the drug is of use in only a small percentage of cases, and that of a particular kind. We can now recognize with fair certainty the cases where it will have a good effect and those cases in which it is of no use.

The recognition of the cases that are benefited by digitalis saves us from giving it to those cases in which it is of no use. Thus, instead of an unintelligent rule of thumb treatment, we study the peculiarities of each individual case in order to find the treatment appropriate to his condition. The manner in which this knowledge was acquired will be described later.

The Investigation of Prognosis.

It will perhaps help to get a clear idea of what I am aiming at if I describe the steps I took to obtain this knowledge in affections of the heart.

On entering general practice my knowledge was much that of the young doctor of to-day, except that perhaps we were better taught in regard to this subject. I was not long in finding out that my knowledge was limited. As an examiner for life insurance I realized that I had no real knowledge of the prospects of a candidate's life. In dealing with my patients I would put people on treatment and restrict their work because of some vague notion that murmurs and irregular action indicated something seriously wrong. The textbooks, to which I appealed again and again, though reputed to deal with prognosis, afforded no help. Recognizing the limitation of my knowledge, I determined to see if it was possible for this knowledge to be acquired.

I saw at once that it would be necessary to watch individuals with what I considered damaged hearts for the rest of their lives to see what happened, and I started to do so. But the question soon arose, What was I to watch? I spent a long time noting with great particularity the murmurs and modified sounds, and the rate of the heart when at rest and on effort. But the results were so unilluminating that I found I was getting no further. I got a sphygmograph and took records of the pulse, and spent much time measuring the height and breadth of the waves, the depth of the notches, seeking in these signs for light upon the subject of prognosis.

In efforts of this kind I spent several years, and felt inclined to give up in despair. My experience at this stage may be of some service to others who undertake similar forms of medical research. Pausing to reflect, I was struck with the resemblance of myself to one of the characters depicted by Bunyan in his *Pilgrim's Progress*. He describes a man earnestly engaged in raking the mud in search for something he was not quite clear about, while above his head shines the crown of glory which was the real object of his research. I felt like the man with the "muck-rake," and I felt certain if he were addressed in modern terms the conversation would be somewhat as follows. If asked what he was doing, he would reply he was collecting stones and twigs and straws. If it was suggested that this seemed a vain quest, he would reply that he was discovering new facts, and as a new fact was an addition to the sum of human knowledge, the quest was therefore justified. Moreover, he might add: I am the first to introduce scientific methods in this research, as I weigh the pebbles and measure the straws.

Rules for the Investigation of Symptoms.

I saw that I must have some clearer guide in my work. I reflected that I had to deal with people in ill health, and the nature of their ill health could only be discovered by understanding the symptoms of disease. The physicians of thirty or forty years ago were, many of them, very capable men. Their minds were not distracted by the numerous methods which to-day are considered necessary for the examination of their patients, so that they cultivated their powers of observation. I had been struck during my student days, and later when I entered practice, by the rapidity and precision of diagnosis, in patients who presented no physical sign, and the assurance with which they would foretell whether an illness would pursue a favourable or unfavourable course. The old doctor to whom I was assistant possessed this faculty in an eminent degree, and I often to-day reflect with admiration on the remarkable certainty of his diagnosis and prognosis. When I was considering my failure to get forward with my investigation I reflected on these matters, and I saw that this knowledge was due to the recognition of subtle signs which could only be detected and appreciated from long and careful observation. The knowledge was personal, and medicine had not advanced so far as to enable a description to be given which would convey the knowledge to others.

Seeing that disease makes itself manifest only by the symptoms it produces, I recognized that the first step in my undertaking would be to acquire a better knowledge of symptoms. In order that my inquiry should be directed in a systematic manner, I laid down three rules for guidance.

1. To differentiate each symptom clearly, and separate it from others it might resemble.
2. To discover the mechanism by which each symptom was produced, and to search for the laws governing the production of symptoms.
3. To assess the value of the symptom, so far as it had a bearing on the patient's future—the prognostic significance of the symptom.

By following these rules I hoped to get an insight into the nature of the diseases of my patients, and to find out the explanation of the older physician's power of diagnosis and prognosis. This was all the more necessary since the vast majority of my patients had no gross physical sign of disease, the symptoms being mainly subjective, or of such a subtle and elusive kind as could only be detected by the trained senses.

Except incidentally, I do not propose to refer to the steps I took to differentiate the symptoms and to understand their mechanism, but I propose to describe at some length how I proceeded to investigate their prognostic significance. This subject has been neglected because those engaged in research do not have its importance thrust upon them. On the other hand, experience had shown me that for intelligent practice this matter was essential, and that these two other fields were but preparatory for this, which is indeed the coping stone of all medical investigation.

As time has gone on I find that the conception of prognosis grew upon me till I now recognize it as the vital spark which endows medical investigation with life and interest, and that what rendered so much endeavour vain and futile was the absence of this life-giving conception. So far no one seems to have realized that this important field was necessary to the completion of all research in medicine.

Prognosis in Heart Affections.

Guided by these rules, I continued the study of affections of the heart. The methods necessary to differentiate symptoms and study their mechanism were comparatively easy to discover, but it was a long time before it became clear how to proceed with the inquiry into prognosis. At last I put to myself the question, "What are you afraid of?" The reply was "Heart failure." The next question then arose, "What is heart failure, and what are the symptoms by which it can be recognized?"

Were murmurs and irregularities signs of heart failure? I had to confess that, except in certain forms of heart failure where dropsy and dyspnoea occurred, I had no idea of the signs of heart failure. Again I turned to my text-books—clinical, physiological, and pathological—for a description of the signs of heart failure, and again discovered that the knowledge did not exist. I recognized that until I knew the signs of heart failure I was incompetent to study the prognostic significance of heart affections. So I set about to acquire this knowledge and spent years in the quest. Though far from completed, I gained knowledge sufficient to enable me to recognize the importance of the subject and how it should be investigated.

Let me explain how this was done. I had first to watch, in people with failing hearts, the appearance of symptoms, and re-educate myself in the examination of the patient so as to differentiate the symptoms clearly.

This, to a certain extent, had been done in regard to murmurs and modified sounds, but the equally common symptom of irregularity had been neglected. After many years I was able to differentiate the irregularities. I had also to study with care the sensations of the patient, for, as I ultimately found, this was the key which brought the solution of the problem. I thus found out the sensations that indicated heart failure. I found, among other things, that the first signs of heart failure were not to be detected in the heart itself, but were shown in the disturbed function of organs remote from the heart. Then I had to see people before the heart was affected; I had to watch the circumstances that weakened the heart; I had to see the effects of hard work, of pregnancy, of intercurrent diseases, and I had to detect the onset of the earliest sign and watch the progress till death. I had to find out the mechanism by which the various symptoms were produced, and to do this I had frequently to resort to the physiologist for help. By the knowledge thus acquired I was able to distinguish those signs which were of significance from those which were of no significance. It will be seen that to understand the subject of prognosis the observer has first to undertake a long training, and then he has to have the opportunity of studying not only acute cases, but cases that proceed gradually for ten or twenty years or longer.

It is impossible for those who have not undertaken this kind of research to understand its difficulties. Let me describe one phase of the subject. One object I had in mind was to understand where lay the danger of pregnancy in a woman with a damaged heart. This is a problem which confronts, time and again, every general practitioner, and it is one of very serious moment to those concerned. The references to this subject in the most recent books on obstetrics have not advanced beyond those published over forty years ago. To undertake this part of the inquiry I had, as I have said, first to train myself to detect the early signs of heart failure. Then I had to study the changes in the circulation and search for the causes producing them, during pregnancy, during confinement, and during the puerperium which occurred in healthy women; I had to watch the changes that took place in women with different forms of heart disease, examining them before pregnancy and at all the subsequent stages. This meant attending them during labour, taking careful observations during the pains and when free from the pains. These observations were not made in a comfortable ward with plenty of help, but often after a hard day's work, during the night in poor cottages, where I had to do the duties of the doctor and nurse, give chloroform, apply the forceps. Yet this work had to be done, and in no other way could the knowledge be acquired.

It will be seen that a matter like prognosis, so essential to medical practice, requires methods and opportunities of a particular kind, but so backward is the state of medicine that neither the methods for acquiring this knowledge nor the value of the knowledge when acquired is understood.

Guiding Principles in Prognosis.

It was necessary not only to seize the opportunity and make a note of symptoms, but to have a clear guiding principle. I want you to grasp this point, for it was the want of this principle that caused me to spend years in "muck-raking." I remember examining repeatedly a man suffering from angina pectoris and failing to detect any physical sign of disease, yet he could not walk 200 yards without being pulled up by an excruciating pain. When he died I found the myocardium extremely atrophied and the coronary arteries blocked. I saw that this condition must have been coming on for many years, and this caused me to reflect on the effects of the damaged muscle. When the man was at rest he was quite well, mentally active, and complained of nothing, but when he made an effort he was pulled up. So I dimly conceived that the symptoms were only produced in response to effort. Then I considered the nature of the heart's functions, and recognized that the muscle force of the heart could be considered as being of two kinds, one to maintain the circulation when the body was at rest, and the other a reserve force, called into play when an effort was made. On reflection I recognized that the first sign of heart failure was bound to be a diminution of this reserve force, and that the earliest symptoms of heart failure would be shown in a response to effort.

I therefore made a long investigation into this response to effort, considering first what happened to people in health. In childhood the response to effort is small, for the child stops after running a few yards. In boyhood it is much greater, and reaches its greatest amount in the heyday of youthful vigour; after that it gradually declines till the old man reaches the limits of his childhood. I compared these results with what happened in disease, and found that the response to effort was restricted in exactly the same way. Then I asked, What are the signs of this limitation? And for a time, being under the delusion that instruments were the most scientific method, I spent much time in recording the rate of the heart, and studying the changes in the character of the pulse by graphic records

and blood-pressure instruments. These did not help. Then it occurred to me to ask of the individual, healthy and ailing, "Why have you to stop," and they all replied, "Because of a feeling of distress." This gave a new turn to my inquiry, and I then investigated this sensation of distress. At first it was difficult to get a clear conception, for I was too ignorant to ask the suitable questions and too ignorant to interpret the answer. After a time I got a little understanding, and gradually the nature of the distress became perfectly clear. The reason why I failed, and, indeed, why the medical world fails to-day, to understand the symptoms of heart failure is because of their extreme simplicity. When we search for the recondite and the obscure we fail to recognize the simple and the obvious.

The sensations of distress which indicate the limitation of the heart's power are of two kinds—breathlessness with its associated phenomena, and pain with its associated phenomena. When you come to think of it, a failing organ does not itself necessarily show its impaired efficiency; rather the symptoms will be shown by the organs which are affected by the diseased organ's failure. Health is the harmonious working of all the organs. The disordered or impaired function of one organ upsets the others, and the signs of ill health are found, not in the inefficient organ, but in the others.

The Estimation of the Functional Efficiency of Organs.

That is a principle which is of universal application, and should be applied to the study of the functional efficiency of every organ.

In regard to the heart, its failure affected structures which did not receive a sufficient supply of pure blood. The respiratory system is the most sensitive, and possesses a mechanism which causes distress when its blood supply is inefficient—so we get breathlessness. The heart muscle, when forced to increased effort, requires more blood, and if it fails to receive an adequate supply it gives expression to its exhaustion by pain, a symptom belonging to the nervous system.

I cannot here explain the steps by which this conclusion was reached, nor show you what a flood of light it has thrown upon that darkest of fields in medicine—the evidences of functional inefficiency of organs. While for many years I have used this knowledge in practice, the full meaning of it was not understood until, in St. Andrews, we had carried the inquiry further, and discovered the mechanism by which such symptoms and the vast majority of other symptoms were produced.

If you reflect, common sense will tell you that the response to effort is the only means by which the efficiency of the heart can be recognized. It is now many years since I called attention to it, yet its significance is not grasped. You can see this failure to grasp it in the medical forms for life insurance. Questions are asked about the size of the heart and its sounds, its rate and its rhythm, but not a single question as to the response to effort. Some companies have an elaborate series of questions for suspected hearts, but in none of these is there any reference to its functional efficiency. People are to-day rejected for life insurance or penalized because of an innocent murmur and irregularity—a mistake which would never occur if insurance examiners understood the response to effort. Other people are passed as fit who would never be accepted if the answer to a simple question was skilfully interpreted. I have on many occasions been consulted by men who had a few months before been insured for large sums, who suffered from such advanced disease of the heart that they died shortly after. There was no physical sign, but their replies to my inquiries as to their response to effort revealed the extreme gravity of their condition.

It requires much experience to use this method, but when the knowledge is acquired it is easy. The testing of a patient by hopping about a room and counting his pulse and taking his blood pressure cannot reveal this information; it is got from the patient's experience when the heart is called upon to do its usual work—such as walking up a hill after a meal, walking in the cold air, and so forth. The reason I mention this is to indicate that artificial tests do not bring out the qualities of an organ, neither in the case of the heart, of the stomach, of the kidney, or of any other organ.

The Misunderstanding of Prognosis.

The lack of understanding of the importance of prognosis comes out in striking and curious ways. A great many people have been engaged in the investigation of irregular heart action, and much of the mechanism has been revealed; but they stop there, being content with the recognition of the different forms of abnormal heart action. To me, on the other hand, this research was but a means to an end, not the end itself—the end being the prognostic significance of the irregularities.

Here is a curious matter. I have received a meed of praise far beyond my deserts for the employment of mechanical methods in general practice. Indeed, I do not doubt that is the reason why I have been honoured to address you to-day, and I have been told that this was the reason I was made F.R.S. That implies a limited outlook upon medicine. The use of these graphic methods was but child's play to the search for the significance of irregular heart action. If you could but grasp what that long search meant—the difficulties to be overcome, the taking up of methods and finding them unfit, the constant study of the patient, the search in literature for all sorts of knowledge that might help—you would realize how heavy was the task and how infinitely more important was the result. And yet, gentlemen, though I have been praised and honoured for the easy task of record-taking, nowhere have I seen any recognition or understanding of what I may say has been the chief object of my life's work.

The Keeping of Records.

Did it ever occur to you why records of patients are kept? Every hospital keeps them as a routine, but it is doubtful if the reasons are understood. The chief purpose of records is to lay the basis of prognosis—that is, to obtain a knowledge of a patient's complaint from data drawn from patients presenting similar symptoms whose progress has been observed. The real purpose of records is to show this progress. They can be used for other purposes, but these are subsidiary. To-day they fail in usefulness because of the absence of a knowledge of prognosis. If you consider the enormous amount of record-taking and record-keeping in all the hospitals and private note-books in the world, with the enormous number of life insurance records, and reflect that if one wished to know what was the significance of some simple sign, such as a heart murmur or irregularity, the information could not be obtained, you will appreciate the futility of record-taking as understood to-day. The records taken to-day are not a bit more helpful than those taken fifty years ago. I know this will be disputed, for there is a belief that medicine has made such gigantic strides that signs and symptoms are now detected that were never before recognized. Thus a physician who has had some laboratory training in biochemistry includes in his notes the chemical constitution of some fluid. Another who has studied the blood will reflect his speciality in his records. If he has studied bacteriology the records will describe the various bacteria found, while blood-pressure records and electro-cardiograms will show the bent of others, and so on. Each one finds his justification in the belief that in recording facts he is adding to the sum of human knowledge, whereas he is but adding to that enormous mass of chaotic details which darkens and confuses medicine to-day.

The Purpose of Records.

The real purpose of record-taking is to relate the life-history of disease in a number of people so that the signs which reveal the disease and show its progress and those which indicate danger can be recognized.

Prognosis is the motive which inspires note-taking with the breath of life, making the notes a perennial source of knowledge that can be applied in the practice of medicine. To obtain records of value, opportunity must be had of seeing disease from its onset till its end, while knowledge of a particular kind is required in order that out of the mass of symptoms those that are essential only are recorded.

While that is the ideal, only those who have recognized it and have striven to attain it understand its difficulties. This ideal, it is to be observed, differs greatly from the practice of to-day when there is too often but a dreary record of undigested symptoms during a passing phase of disease.

The Records of Mitral Stenosis.

In order to convey some idea of the method and purpose of record-taking, let me cite my observations on mitral stenosis. It is over fifty years since the presystolic murmur was recognized as indicating stenosis of the mitral valve. If you turn to most textbooks you will find that since that day no progress has been made in our knowledge of this murmur, or indeed of any other murmur—that is to say, for fifty years auscultation has not progressed, and notwithstanding all the alert minds that have been engaged in clinical medicine, no conception existed as to how progress should be made. But as soon as I was possessed of the idea to find what happens to the individual with a presystolic murmur, new life was breathed into my work, and a way of progress opened up.

Early in my career as a general practitioner I found that the presence of mitral stenosis was associated with danger to pregnant women as well as to others. It was necessary to know wherein lay the danger. To understand this it was necessary to know the life-history of people with this trouble. I therefore began a series of observations on patients with rheumatic fever or who had had rheumatic fever. I kept in contact with them for many years, and watched the progressive changes that took place in the sounds of the heart. In this way I discovered that the murmur peculiar to mitral stenosis—the presystolic—did not occur during the causative attack but at variable times afterwards—usually several years. The murmur at first was short in duration and was not always present. As time went on it became of longer duration and constant. By-and-by another murmur appeared, diastolic in time. This increased in length until it ran into the presystolic, so that during the diastole of the ventricle there was a continuous murmur. When such patients died the mitral orifice was reduced to a mere slit. One infers that the cicatrizing process is gradual, and that these changes in the murmur are due to increase of the cicatrizing process which narrows the orifice. But the point of importance is that you are given an idea of the stage of narrowing that has been reached. Moreover, the rate of progress varies greatly; some only reach a certain stage and remain stationary. The recognition of this gives a further guide to prognosis. It is necessary, for instance, in advising as to a woman's fitness for child-bearing to know whether the stenosis is stationary or advancing rapidly, and this knowledge is obtained by recognizing the peculiar features of the murmur, whether short or long, or whether a diastolic murmur is present, with a knowledge of the time of the causal attack. Thus, a short presystolic murmur with a history of rheumatic fever ten or fifteen years before would indicate a favourable prognosis, while a presystolic and diastolic murmur with a history of four or five years would give a much graver outlook. To-day, amongst obstetric physicians, there is much confusion, for, while one group says mitral stenosis is a very dangerous complication, others declare it not to be of serious significance, the reason being that each speaks of the cases that come within his own experience, none recognizing the principle that should guide them.

But in this inquiry I was struck with the great diversity of phenomena that arose. Thus some patients suffered from severe heart failure and died while yet the stenosis was slight in degree. Others pursued laborious occupations when the stenosis was far advanced. I therefore recognized that there were other factors, the chief of which I found to be a coincident damage to the heart muscle. Sometimes this could be made out by the changes in the size of the heart, or by the presence of partial heart-block, but the most instructive indication was the response to effort. This meant that the mitral stenosis was but one factor in assessing the functional efficiency of the heart, and that it was necessary to consider the associated phenomena and particularly the response to effort.

Many instructive phenomena, which explained features that had puzzled clinical observers (to some of these I will refer later), came under notice during this research. But the most striking and most dramatic was the sudden onset of extreme heart failure that every now and again overtook some of these patients. One, whom I had watched for seventeen years, and who had lived a useful and industrious life as a nurse, was suddenly seized with great breathlessness, and the heart became rapid in its rate and dilated. She was cyanosed, the liver was enlarged, and dropsy set in. On taking graphic records I found that the rhythm was very irregular and the auricular wave had disappeared from the jugular and liver pulses. On listening to the heart the presystolic murmur, which had been present, had disappeared. Thus all signs of auricular activity had disappeared.

My attention being arrested by these signs I sought for similar conditions and found that these cases were frequent and occurred independent of mitral stenosis, so that I was able to recognize a definite and distinct type among heart cases. Indeed, I found that between 80 and 90 per cent. of cases of heart failure with dropsy and enlarged liver were of this type. I then proceeded to watch these cases to see what happened, and I found that on the onset of this abnormal rhythm the heart failure set in with such severity that some died within a few days, others within a few weeks, others led a crippled existence for months or a few years, while others lived comfortably at a lower level for many years, and in a few the onset was not accompanied by any limitation of the heart power. Seeing these very diverse results I set about a long inquiry into the reasons. I found that in those who did well after the onset, though the heart rhythm became irregular, the rate did not alter. On the other hand, in those who did badly the rate became increased, sometimes greatly. In watching them I found that if the rate slowed the patient improved, so I looked for means for slowing the rate and naturally turned to digitalis. I gave the digitalis at first timorously, as we were brought up to look upon it as a dangerous though useful drug, then more and more boldly, till I found the quantity that would slow the heart. When I had acquired a knowledge of the drug and how to administer it, I was able to give speedily the greatest relief to many patients who were apparently *in extremis*. But I found that as soon as the drug was stopped the patients relapsed, so I set about discovering how to give the drug so as to keep the pulse at a moderate rate, and at last devised a method by which many people who were apparently hopelessly broken down were enabled to resume their occupations.

In some the digitalis or other drugs would not slow the rate, and these invariably drifted and died. In others in whom the heart slowed, the symptoms of heart failure were not relieved—these also speedily sunk and died. The *post-mortem* examination in these cases invariably revealed such extensive damage of the heart muscle that one could infer that such hearts, embarrassed by the abnormal rhythm, were inconsistent with life.

I need not go into the numerous interesting points that arose from this inquiry. One I may mention was that the particular kind of rapid heart for which digitalis is the remedy stood now clearly revealed, as I have already said. If you have grasped the significance of the methods I adopted for getting the prognosis you will at once see what a powerful weapon has been placed in our hands, and with what confidence we are now able to give a clear prognosis based upon accurate observation and sound principles.

Many years after, this condition was discovered from experimental search to be due to fibrillation of the auricle, and it is a curious illustration of the lack of perception of the essentials of medicine that the discovery of this condition is frequently assumed to have occurred only when it was demonstrated in the laboratory. All that work which revealed its clinical symptoms, which laid the basis of a sound prognosis, and which indicated rational lines of treatment, is practically ignored. The research in the laboratory has indeed helped to a partial understanding of the mechanism, and to differentiate this condition from others it resembled, but it has not added one iota to the knowledge necessary to clinical practice. Indeed, so little is the significance of this inquiry realized that in books and articles written by cardiologists you seldom find any appreciation of the basis for a rational treatment, let alone a rational prognosis.

I do not quote this in order to disparage laboratory work or to praise myself, but to demonstrate the blindness to what is essential in medical inquiry—to illustrate the limitations of laboratory investigations into diseased states. While we recognize the presence of auricular fibrillation, we do not know the conditions which induce it, nor is there the slightest expectation that laboratory experiment will reveal it. I have a poor woman who suffers from haemorrhages, which occur spontaneously under the skin. It would not throw any light upon her

ill health to give a man a black eye. It is vain to expect to discover a process of disease by applying to a healthy organ a stimulus of a kind which nature never employs. A disservice is thus done to experimental work, inasmuch as it is asked to reveal that which it cannot reveal.

New Fields Opened up by the Study of Symptoms.

In watching the life-history of patients with mitral stenosis a great number of instructive incidents occurred. By keeping in mind the rules I had adopted of differentiating the symptoms and recognizing their mechanism and their prognostic significance a light was thrown beyond the immediate object of research and opened up other fields of inquiry. There was revealed, for instance, the nature of many functional abnormalities, which could not be shown by experiment or by the study of dead organs. Thus one man whom I attended for rheumatic fever in 1880 was left with a damaged heart and a systolic murmur. It was ten years later before I detected a presystolic murmur. Later I recognized that this murmur became separated from the first sound by a short pause—a feature which had been described as a mid-diastolic murmur. Records of the jugular pulse showed that at the time of this mid-diastolic murmur there was a wave in the jugular vein due to the contraction of the right auricle, and there was an increase in the interval after the wave before the carotid pulse appeared. By-and-by I was able to recognize that this meant a delay in the transmission of the stimulus from the auricle to the ventricle, and from this inferred that the bundle connecting auricle and ventricle had been damaged. So that we can now recognize that a mid-diastolic murmur means not only mitral stenosis but a partial heart-block. With the recognition of this delay between the auricular and ventricular systoles we caught the early stage of that condition which goes by the name of Stokes-Adams syndrome.

But much more was learnt. I had found that one effect of digitalis was to increase this delay, so that at times the stimulus from the auricle fail d to reach the ventricle, and a beat would drop out, and thus was explained one effect of digitalis that had hitherto baffled interpretation.

The continued observation of this patient revealed other important changes. He used to come and see me every two or three weeks. In April, 1904, I found for the first time that his pulse was irregular. On further examination, I found that the mid-diastolic murmur had disappeared, while the auricular wave also was absent from his jugular tracing—that is to say, all evidence of activity of both auricles had disappeared—the disappearance of the murmur was a sign of cessation of activity of the left auricle, and the disappearance of the wave in the jugular a sign of the cessation of activity of the right auricle.

This condition continued for a week; then one day I found both murmur and auricular wave had returned and the rhythm had become quite regular. The heart continued thus until the following November, when the irregularity returned with the cessation of auricular activity. This condition persisted till his death ten years later.

One instructive point was this: I had observed, as I have said, that when these events happened heart failure usually set in, sometimes speedily. This man was unconscious of the changes, and he continued his laborious work—that of a mechanical engineer—with no signs of heart failure. On seeking for a reason, I found that in his case though the rhythm had become irregular the rate had not increased; both before and after the rate was about 60.

The reason for this was no doubt the presence of the partial heart block. I had recognized that digitalis acted on the bundle and produced heart-block. The cases that did badly and suffered from heart failure after the onset of auricular fibrillation had the rate of the heart greatly increased. It occurred to me, if I could imitate this heart-block by using digitalis, the ventricle in these cases might be kept slow and heart failure prevented. This was found to be correct, and in this way was found that treatment which has robbed auricular fibrillation of much of its peril.

The Basis of a Scientific Therapy.

A matter which strikes everyone who gives it attention is the curious difference between theoretical therapy and practical.

We have the experimental pharmacologist demonstrating to the student with precision the effects of remedies by animal experiment. The student as soon as he enters the wards of the hospital finds a different atmosphere—drugs are administered without any reference to their experimental effects, and he finds the knowledge he has acquired in his pharmacological course of no use.

The pharmacologist scoffs at the clinician as unscientific and as employing empirical methods. The clinician replies that the laboratory teaching is academic and unpractical.

I have already remarked that the action of digitalis on the human heart was not understood, and when I made the observations on the effects of digitalis during this inquiry into mitral stenosis, I was struck by the variety of results I obtained. In one patient digitalis would produce dropping out of beats due to heart-block; in another it would cause the whole heart to stand still for two or three seconds and then the ventricle would start off by itself; in another great slowing would result, and so on. When I looked at these patients individually, I found they all suffered from damaged hearts, but there were differences in the kind of damage, and I therefore formulated the theory that *the action of digitalis is modified by the nature of the disease.* It is manifest that the pharmacologist could never find this out, and his results were different, therefore, from that of the clinician. On the other hand, the knowledge of heart irregularities was so defective that the clinical observer could not recognize them, but saw that they were different from the des ription given by the laboratory observer. That is the reason of the failure of the pharmacologist to explain the action of digitalis on the human heart, and the reason why the clinician could not recognize it.

This principle, at first dimly perceived, holds out the possibility of directing therapeutical research on lines based upon sound principles. One of the least creditable fields of knowledge is the therapeutic. While many drugs are usefully employed, it must be confessed that our knowledge of the action of remedies is sadly lacking in accuracy. To this defect must be attributed that wide diversity of opinion as to the action of the simpler remedies and that confusion which bewilders the student. This inquiry into the nature of symptoms led us at St. Andrews to recognize that a great mass of symptoms is due to disturbances of normal reflexes. When a man falls ill, due, say, to the invasion of his body by a microbe, the toxins of this microbe produce the ill health by upsetting the normal reflexes, and we recognize these disturbances in the signs of disease.

The administration of a drug such as atropine acts in the same way by disturbing certain reflexes. Indeed, the effect of atropine may be described as an imitation disease. One of its effects is to paralyse the peripheral ends of the vagus and cause an increase in the heart rate. If digitalis is given it is without effect, because digitalis stimulates the vagus, and under atropine it is paralysed.

In certain infections the heart rate is increased because the toxins act like atropine, and digitalis does not slow the heart because the vagus is paralysed, and that is the reason why digitalis does not slow the heart in a great many febrile and other conditions.

In auricular fibrillation the increased pulse rate is due to a totally different mechanism. Here the ventricles are stimulated to increased rate by a shower of stimuli from the fibrillating auricle. The vagus is unaffected, and so the digitalis, when given, acts as we have seen on the bundle which conveys the stimulus from auricle to ventricle, and it is probably in this way that digitalis is so effective in slowing the heart rate in auricular fibrillation.

The First Step in Investigating Disease.

Many visitors come to see our institute at St. Andrews, and they go away disappointed at what they see. Our work is not spectacular—our chief method is seen to be a general practitioner quietly asking questions of a patient who has little the matter with him. A learned physician one day was being shown over the institute. He came to the general practitioner engaged in his work. He looked at the notes and said, "Ah! applying hospital methods to general practice?" "No," I replied, "we are training ourselves how to examine patients. We find that students are never trained to examine patients so as to fit them for general practice." "Oh, nonsense!" said he; "they are well enough trained." "Well," I replied, "you have been teaching students at least for twenty-five years?"

"Yes," he said. Then I asked him: "Can you tell me the symptom of which the majority of people complain when they fall sick?" After some consideration he said, "No." I said, "The most common complaint is exhaustion. Can you tell me what is exhaustion?" He again, after a little consideration, said "No." "So," I said, "here is a symptom of the most common kind, a symptom which, when understood, throws a flood of light upon the patient's state, and yet you, who reckon to be able to teach students how to examine patients, have never given it the slightest consideration." I quote this incident to show what should be the first step in investigating disease, and the only individual whose opportunity permits him to take it. The necessity that the general practitioner should participate in other fields of research is obvious as soon as a real perception of medical research is obtained.

I know quite well that these views at present will fail to carry conviction. All I wish you to do is to pause from time to time and ask whether they are true.

INFECTIVE ARTHRITIS AND ALLIED CONDITIONS:

*WITH SPECIAL REFERENCE TO ETIOLOGY AND TREATMENT.**

BY

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[*With Special Plate.*]

EVERY practitioner sees daily many sufferers from some or other variety of the numerous conditions included under the term "chronic rheumatism," and it will be agreed that the picture of chronic rheumatic complaints has altered somewhat since 1914. For example, owing partly to the restrictions upon food and drink, pure gout has become an extremely rare disease. On the other hand, there has certainly been no diminution in the frequency of occurrence of arthritis in its non-specific forms or of the various types of fibrositis, perineuritis, and allied conditions. These form a large, and many think an increasing, proportion of the cases of disabling illness.

The object of this paper is to endeavour to throw some light on the causation of these many forms of chronic rheumatism of doubtful etiology, and to indicate the lines of investigation and treatment which are most productive of good results not only for existing attacks, but in the prevention of recurrences.

ETIOLOGICAL FACTORS.

Much has been written about the causes of chronic rheumatic affections, but the majority of these can only be regarded as predisposing conditions and not as true causes.

Sex has been regarded as a predisposing factor in the causation of infective arthritis, the frequency in females being stated to be something like four times that in males. I do not think that this difference holds with regard to the allied conditions—namely, the various forms of fibrositis—for it has been my experience that their incidence greatly preponderates amongst males.

Age.—While infective arthritis is rare under ten years, all ages are susceptible. Dr. G. F. Still described a form of infective arthritis occurring in children of early years, eight of his first twelve published cases occurring under the age of 3. From the age of 20 years infective arthritis has a relatively large incidence for all ages, and the small numbers given for advanced ages are to be explained by the small population from which they are drawn at these periods of life.

Race.—Arthritis and allied conditions have a lower incidence rate amongst coloured than white races. Osler and McCrae, in their American statistics, have alluded to the relative immunity of the negro race. My experience amongst large numbers of Indian troops in Mesopotamia was that arthritis and chronic rheumatic conditions were very uncommon.

Family History.—A family history of arthritis is commonly obtained from sufferers. It does not appear that the disease is hereditary, but it seems likely that there is inherited a tendency for the joints or fibrous tissues to be affected when a person is subjected to an exciting infective cause. Thus, a streptococcal infection may in one person give rise to chronic arthritis, while in another a severe anaemia or an infective endocarditis may result.

Mental strain and debility, by lowering the general resistance, predispose, if the exciting infective cause is present.

Trauma and physical strain can cause an arthritis or fibrositis, but this condition will not be progressive unless some infective cause-condition is present at the time of the injury. It is well known that an injury is often the starting point of a progressive arthritis, and this is commonly the case in osteo-arthritis of the hip-joint. Similarly an attack of lumbago often follows the lifting of a heavy weight or some undue strain of that kind.

Exposure to cold, wet and damp, and the living in houses without proper damp-proof courses, particularly in districts where the subsoil is damp and the subsoil water high, all act as predisposing causes.

Pregnancy and parturition are sometimes followed by a non-specific infective arthritis. It is well known that an existing infection in the body—for example, pulmonary tuberculosis—often undergoes a rapid development as the result of pregnancy, and in a similar way a latent streptococcal or other infection may be set up and cause a non-specific infective arthritis. This is the probable explanation of the etiological bearing of pregnancy on arthritis.

Disease of the nervous system is not associated with infective arthritis or the various forms of fibrositis. The changes seen in the so-called Charcot's joints of tabes or syringomyelia are due to trophic changes from spinal cord disease, which, together often with trauma, lead to severe organic changes in the affected joints.

Faulty Metabolism.—For many years dietetic errors in food and drink held sway as supposed exciting causes. Excess of protein in the dietary, the taking of alcoholic beverages such as certain wines and beer, the taking of acid fruits, were all thought to play an important part. The modern view is that metabolic factors have little or no influence in the causation of infective arthritis. In the allied conditions, such as the various forms of fibrositis, some regulation of the diet is advisable in plethoric patients, but the true cause is not to be found in dietetic errors. Undoubtedly metabolic factors play an important part in the causation of true gout where the accumulation of uric acid and allied substances in the system acts as an exciting cause.

Rheumatic Fever.—This must be regarded as quite distinct from the diseases under consideration, and the various manifestations of acute rheumatism are well known and form a special clinical entity. There does not appear to be any definite association between rheumatic fever and infective arthritis, though not infrequently cases of infective arthritis are seen in which there is a past history of one or more attacks of rheumatic fever which have been associated with definite valvular lesions.

Infective Causes.—The conclusion which forces itself upon one from a close study of cases of non-specific infective arthritis and allied conditions is that the real exciting cause is an infection, the continued absorption of toxic substances giving rise to the inflammatory changes in the joints and fibrous tissues. It has been my experience that in the great majority of these cases a streptococcal infection from some focus in the body is the exciting cause, though in some cases another organism may cause similar effects—for example, the *Bacillus coli communis* group of bacteria.

Arthritis from specific infections is well known—for example, gonorrhoea may give rise to arthritis and inflammations of tendons and fibrous tissues generally, and the specific organism has frequently been obtained from the fluid of affected joints. Bacillary dysentery is well known to be sometimes associated with arthritis, and the specific organism has on some occasions been obtained from the fluid of the affected joint. As in the case of gonorrhoea the tendons and fibrous tissues generally may be involved, and a conjunctivitis has been observed in both these specific forms of arthritis. Scarlet fever is well known to be frequently complicated by an

* A lecture delivered to the Derby Division of the British Medical Association on February 8th, 1921.

arthritis and fibrositis. Malta fever, typhoid, and paratyphoid fever sometimes give rise to a specific arthritis or fibrositis. Pneumonia and pneumococcal infections have on many occasions been complicated by an acute arthritis, the organism being obtained from the joint effusion. Tuberculosis and syphilis are well known as the causes of a specific arthritis. Acute septicaemia and pyaemia are sometimes accompanied by suppurative arthritis. Indeed, it may be said that almost all the known infectious diseases may be accompanied by an arthritis or fibrositis, due no doubt to the specific infection of the disease. I have seen the most intense periosteal pain and tenderness occur in a patient affected with glanders, and in this case a painful swelling occurred in the tendon of the gastrocnemius muscle, which on being opened was found to contain the bacillus of glanders.

Arthritis of known causation may be classified thus:

1. Traumatic.
2. Arthritis due to the specific infection of known diseases as already enumerated, in which should be included rheumatic fever.
3. Gout.
4. Arthritis following the injections of animal serums—for example, antidysenteric serum, antidiphtherial serum, in which case a joint effusion occurs without permanent organic changes in the joint structure.
5. Arthritis of neuropathic type due to diseases of the spinal cord, such as tabes dorsalis, syringomyelia.
6. Arthritis associated with (*a*) haemophilia, when an effusion of blood occurs into the joint, or (*b*) scurvy, when a serosanguineous effusion occurs in the joint and joint structures.

The above forms of arthritis are excluded from consideration in this paper, and there remains the very large group of cases which have been described under the terms:

Rheumatoid arthritis.
Arthritis deformans.
Osteo-arthritis.
Chronic villous arthritis.

Each of these is in all probability due to an infective cause of non-specific origin. Though typical cases of each group differ in their morbid appearances, yet great similarities are present in all, and a case belonging in its early stages to one group may in its later stages develop into another. For example, a case of rheumatoid arthritis, or of villous arthritis, may in the later stages of the disease develop the typical bone changes of osteo-arthritis. These types of arthritis are all included under the one heading, non-specific infective arthritis.

Of similar etiology and often associated in occurrence are the various forms of fibrositis—namely:

Panniculitis, inflammatory conditions of fasciae and aponeuroses, as occurs in lumbago and myalgic conditions.
Inflammations of tendons and ligaments, such as stiff-neck, tender heels due to involvement of the plantar ligaments, Dupuytren's contractures of the palmar fascia.
Inflammations of tendon sheaths, as in teno-synovitis.
Bursitis.
Heberden's nodes.
Finger pads.
Fibrous nodules in subcutaneous tissue.
Local perineuritis and neuritis, as in sciatica, brachial neuritis.

PATHOLOGY.

The above conditions, when not associated with a general specific infection, are, I believe, in all cases due to some localized infection of the body, generally of a streptococcal nature. The organism causing the infection cannot usually be obtained from the affected joint or tissue, and in all probability the pathological changes are due to the toxins absorbed. A very large number of bacteriological examinations of the affected joints have been made by numerous skilled observers, but no specific organism has been found, and generally the results have been negative. In a few cases a streptococcus or a bacillus has been found in the affected joints, but proof has generally been wanting that this organism was the primary cause of the arthritis in question.

Poynton and Paine isolated from one case of infective arthritis a streptococcus, which caused similar lesions in rabbits. It appears probable that in the majority of cases the affected joints and tissues are devoid of living bacteria. This is not surprising, since the causal infection is often of a relatively low type of virulence and often far distant from the affected joints. Analogous examples are the pleurisy with sterile effusion frequently found over a subphrenic abscess containing pathogenic organisms.

I have this year seen a striking example of a very acute inflammation without any bacterial infection, caused by the bacterial infection of a neighbouring organ.

A patient was attacked with an acute empyema of the right pleural cavity and a heavy infection of streptococci was found. The empyema was opened and drained, but an acute pericarditis with effusion was also present, and three weeks later the pericardium was opened. It was found to be in a state of acute inflammation, with much clear effusion and early adhesions. The pericarditis fluid contained no organisms and was quite sterile on culture.

The cause of an infective arthritis should always be sought for. A careful clinical examination of all the organs should be made, but frequently no apparent cause is visible.

Infection from Teeth.—The commonest cause of infection is to be found in connexion with the teeth sockets. Dr. Beddard in October, 1918 (*Transactions, Medical Society of London*), placed 90 per cent. of cases of so-called rheumatoid arthritis in this category, and my personal experience agrees with this view. Very commonly the teeth and gums appear healthy, and give rise to little suspicion even after a close examination, but sometimes there may be visual evidence of caries and gingivitis, and on pressure pus may be expressed from the space between the gum and the teeth. It cannot be too clearly realized that the infection which is most likely to be the cause of an arthritis and allied conditions is often deeply seated near the apex of the tooth and gives rise to no symptoms whatever, and pain, swelling and tenderness may be entirely absent. The only certain method of examination of the tooth sockets is by means of *x* rays; this should be done in every case, photographs of the individual teeth being taken. Usually there is definite evidence of osteitis with rarefaction or destruction of the alveolus, and the most striking evidence of all is the indication of an apical abscess shown in the print by the clear white space deep to the apex of the tooth. This space is invariably filled with pus and granulations heavily infected with pathogenic streptococci and must serve as a constant supply of virulent toxins, if not of bacteria, into the blood stream. On very many occasions I have found this condition associated with infective arthritis, and the various forms of fibrositis. In one case under my care an abscess of this kind was the undoubted cause of malignant endocarditis, an identical organism being found in the blood stream and dental abscess. During the last eighteen months I have seen four cases of infective endocarditis in which the infection undoubtedly arose from pyorrhoea alveolaris.

Dr. Bertram Watson, in the *Lancet* of January 1st, 1921, has called attention to the numerous pathological conditions in addition to arthritis and fibrositis arising from apical dental infection, such as iritis, iridocyclitis, retrobulbar optic neuritis, dyspepsia, and skin eruptions. The association of severe secondary and pernicious anaemia with dental infections is well known from the work of Hunter. Recent work by Rosenow and others in America has shown that the cause of gastric and duodenal ulcer is often to be found in dental infections. It seems probable that appendicitis, cholelithiasis, and colitis may in some instances be traced to the same cause. The accompanying prints (see Special Plate) from *x*-ray photographs of teeth taken by Mr. C. A. Clark, M.R.C.S., L.R.C.P., L.D.S., illustrate some of the pathological conditions commonly found in cases of non-specific infective arthritis and allied conditions.

Intestinal Infections.—Where arthritis is present, and a dental origin is discovered, almost always streptococci showing similar bacteriological characters are found in profusion in the faeces, and in cases of progressive arthritis after all the teeth have been removed there is usually found bacteriological evidence of a marked streptococcal intestinal infection. Intestinal infections may, apart from dental infections, give rise to arthritis, but in such cases there is generally evidence of attacks of entero-colitis with diarrhoea and loose stools containing mucus. The causation of dysenteric arthritis by bacillary dysentery has been mentioned. In this country intestinal infections are uncommon primary infective causes of arthritis.

Tonsils and Adenoids.—A septic condition of these organs, of streptococcal type, may give rise to arthritis and allied conditions. A careful examination of the tonsils should always be made, and if unhealthy-looking, pressure should be applied to see if pus can be expressed.

The maxillary antra and nasal sinuses should be carefully examined by illumination, etc., for a possible source of infection. The uterus and genital organs also should be examined for possible sources of infection. In my experience infections from these organs apart from gonorrhoea are very rarely the cause of arthritis and allied conditions. Any focus of suppuration may act as the cause of a general infective arthritis; thus infected wounds or a suppurating joint may give rise to a non-suppurating general arthritis. (McCrae.)

Morbid Anatomy.

The morbid changes in the joints in this condition have been described by Strangeways and others. Briefly, they consist of swelling and hyperaemia of the synovial membrane, and in the villous form this may attain a high degree of proliferation. The fluid in the joint is slightly turbid from the presence of small fibrous deposits, and usually contains lymphocytes and a few polynuclear cells. Later the capsule of the joint becomes involved, and inflammatory processes are set up which may go on to thickening and contraction. The cartilage of the joint becomes affected, the surface being roughened and irregular with small elevations, and a fibrous tissue degeneration involves it with blood vessels spreading through. The cartilage becomes thinned and may almost entirely disappear.

Atrophic changes occur in the bones and the density becomes diminished. At the apposed surfaces absorption occurs in advanced cases, and at the periphery osteophytic outgrowths of softish bone occur so that a mushroom appearance may be produced. In the synovial fringes thickened fibrous nodules partly calcified may develop, and these sometimes become dislodged, forming loose bodies in the joint. In extreme cases a fibrous or partly bony ankylosis may result.

The changes to be seen in *x*-ray photographs are rarefaction of the involved bone, a fuzziness of the articular surface, as if a very thin layer of fine cotton-wool covered them, due to the irregularity of the surface of the bone in consequence of the changes described. The clear space between the opposed bones is diminished as a result of cartilage absorption. Loose osteophytes may be seen in some cases. Lipping of the bones or slight outgrowths may be seen.

Symptoms and Physical Signs.

It cannot be too strongly insisted upon that the most careful examination must be made to determine exactly what structures are affected. Each joint should be carefully examined for evidence of swelling, pain on movement, crepitation, creaking or grating.

A careful examination should be made of the bursae around the joints, of the tendons, and the tendon sheaths.

Wasting of the muscles above and below an affected joint is sure to be present in arthritis of appreciable duration, and where the hands and feet are involved trophic changes, such as sweating, pallor and thinning of the skin, and defective circulation, are usually present. The freedom of movement in all directions of each joint should be carefully tested and any limitation noticed.

When there are symptoms of fibrositis a close examination should be made to determine whether the fasciae, muscles, tendons, or nerve trunks are involved. Pressure should be made on the affected part, and where brachial neuritis or sciatica is suspected the nerve trunks should be pressed upon to see if tenderness is elicited, and movements of the limbs made which will put on stretch the nerve trunks, and so elicit marked pain if they are affected.

It is not proposed to give in detail the signs and symptoms of infective arthritis. Some cases begin with an acute onset of pyrexia and general in addition to the local symptoms. Undoubtedly cases of infective arthritis occur which completely clear up with rest and treatment after an attack of moderate duration. Generally, however, the condition is progressive, and unless the cause of the disease is removed no permanent improvement will result.

In the majority of cases of arthritis the onset is insidious and gradual, a localized pain and swelling in an affected joint or joints occurs, and this progresses, other joints being involved, usually in a comparatively symmetrical manner. The involvement of the joints is usually accompanied by general pains, described as rheumatic in nature, and no fever may occur, though malaise, depression, headaches, anaemia, and debility are usual. Cardiac complications are absent as a rule, and beyond the joint affections, and the general malaise and ill health often associated with marked wasting, little is found. The tendon reflexes over affected joints are usually exaggerated, owing to the excitability of the reflex nervous arc caused thereby. The temporo-maxillary joint is involved much more often in infective arthritis, and this is an important point in diagnosis. The earliest joints involved are often the metacarpo-carpal joints of the thumb and the phalangeal or metacarpal or carpal joints of the hands, but any joint may be primarily affected.

Heberden's nodes, the fibrous enlargements on each side of the distal ends of the second phalanges of the hands, are often present in cases of infective arthritis. Osler states that these are rarely associated with serious involvement of the larger joints, with which my experience entirely agrees. A hopeful feature of them is that they have been regarded as a sign of longevity.

Treatment.

The most important step is first to find out the cause of the infection which has given rise to the arthritis. The measures to be adopted have been already indicated. A careful and complete clinical examination should be made to find out any possible source of infection, and this should be supplemented by an *x*-ray examination of the teeth and bacteriological examination of the stools and urine.

In acute cases with pyrexia absolute rest in bed is essential and complete rest of the affected joints. Local applications of heat, such as electric-light baths, or fomentations, iodine poultices, etc., are of value. Salicylates, which are of such striking benefit in rheumatic fever, are of little value. Indeed, drugs, except for the relief of pain—such as pyramidon and phenacetin—are not of much use. Intestinal antiseptics—such as guaiacol carbonate gr.x t.d.s. or cyllin miii—should be given. A new intestinal antiseptic, "dimol," which is said to have fifteen times the disinfecting power of phenol and to be non-toxic, may be given in doses of 2 to 4 grains in keratin capsules three times daily. Bier's treatment is of value until the exciting cause has been determined; an elastic bandage is placed round the limb above the affected joint so as to obstruct the veins but not the arteries, and is left on for twenty minutes daily.

In cases without pyrexia, if there are signs of active inflammation in the joint, such as redness, heat, swelling, or pain, rest of the joint is essential, and local and general treatment as above should be prescribed. Iodine is of value. Collosol iodine in doses of 1 to 2 drachms with a wineglassful of water should be given twice daily. Iodides, if tolerated, may be given instead.

As soon as the source of infection is found this should be eradicated if possible. Where the teeth are implicated or an apical dental infection is found, the affected teeth should be removed and placed in a sterile vessel for bacteriological examination. A satisfactory way of dealing with an apical infection is Gardner's method of sterilizing the infected bone area by removal of the alveolar layer over the site of the lesion and curetting away the diseased tissue, and sterilization after removal of the offending tooth. This involves a cutting operation over the gum of the affected part.

Vaccine Treatment.—This is of great value, but it cannot be too strongly insisted upon that it must be accompanied by removal of the causal infections. Affected teeth should be removed, and a vaccine prepared after guarding against possible contamination of the teeth removed with normal streptococcal organism found in the mouth. A course of at least three months of vaccine treatment is usually required, with weekly and later fortnightly doses. It is a wise procedure to have a bacteriological examination of the faeces made, even if a dental streptococcal infection has been found. Usually an abnormal streptococcal intestinal infection is also present in such cases. It is then an advantage to use for treatment a combined vaccine made with equal proportions of the dental and intestinal streptococci. In cases where the teeth have been removed and arthritis still persists, an examination of the faeces or colon washings will usually indicate a streptococcal infection, and in such cases vaccine treatment may give benefit.

W. H. WILLCOX: INFECTIVE ARTHRITIS AND ALLIED CONDITIONS.

FIG. 1.—Apical abscesses in upper premolars.

FIG. 2.—Marked loss of alveolus due to pyorrhoea; apical abscesses on both roots of first lower molar and on anterior root of second molar.

FIG. 3.—Apical abscess on first lower molar—both roots.

FIG. 4.—Marked loss of alveolus due to pyorrhoea; apical abscess of lower premolar.

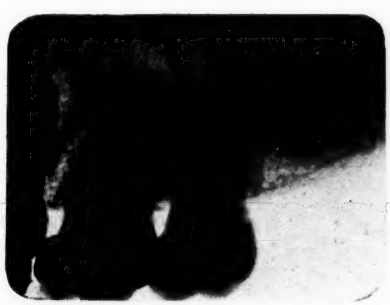

FIG. 5.—Apical abscess of premolar of upper jaw, close to floor of antrum.

FIG. 6.—Apical abscess of lower premolar.

J. P. LOCKHART-MUMMERY: COCCYGEAL FISTULAE.

FIG. 1.—Section of wall of fistula showing epithelial lining.

FIG. 2.—Wall of fistulous track showing epithelium and giant cells.

FIG. 3.—High power view of epithelial wall of fistula.

A. MITCHELL: ACUTE OSTEOMYELITIS OF THE LONG BONES IN CHILDREN.

From a case in which subperiosteal resection of the tibia was performed on November 30th, 1919.

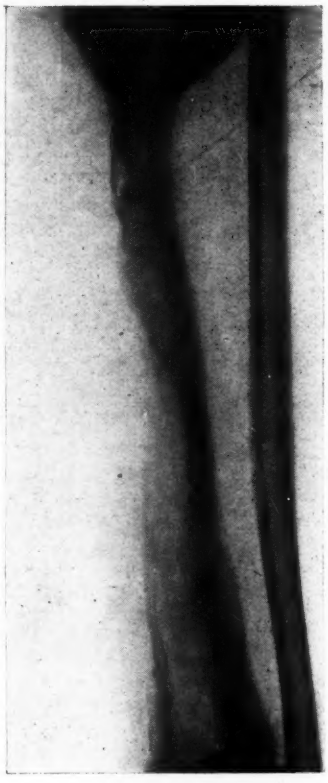

FIG. 1.—Showing the amount of regeneration that has taken place at three months after operation.

FIG. 2.—Showing amount of regeneration at four months after operation.

FIG. 3.—Photograph of the leg seven months after operation. The tibia is firm and strong and the range of movement in the knee and ankle joints is almost equal to normal.

H. S. CARTER AND W. FLEMING: IDIOPATHIC MUSCULAR DYSTROPHY.

FIG. 1.—Showing the marked lordosis in the erect posture, and the flattening of the chest.

FIG. 2.—Showing the atrophy of the thighs, the enlarged tensor fasciae femoris muscles, the early "taille de guêpe," and the flattening of the chest.

FIG. 3.—Showing the enlargement of the spinati and the atrophy of the rhomboids and lower muscles.

Electrical Treatment.—In chronic and subacute cases electric light or radiant heat treatment should be given daily or on alternate days, and this should be immediately followed by ionization with iodine ions, a 2 per cent. solution of lithium iodide being placed on the lint of the kathode. In cases where much pain is present ionization with salicylic acid ions is of value. Diathermy is of value in relief of pain.

Massage, etc.—When there are no signs of active inflammation and the infective cause has been removed, massage and movements of the joints are indicated. Where the joint movements are much limited in such cases breaking down of adhesions under an anaesthetic or suitable surgical measures may be adopted.

Diet.—In pyrexial cases the diet should be mainly liquid. It must be borne in mind that most cases of non-specific infective arthritis require a diet of high nutritive value, and attention should be directed towards giving a dietary rich in vitamins. Milk, cream, eggs, the unheated juice of fresh lemons or oranges, fresh fruits and vegetables, fish, chicken, and meat, may be given according to the digestive capacity of the patient. If tolerated, milk fermented with lactic acid bacilli is of value in controlling intestinal fermentation. Cod-liver oil and malt, or one of the many substitutes for this now on the market, may also be given with advantage.

In cases of fibrositis of aponeuroses and tendons local electric light and massage gives the best results; diathermy and ionization are sometimes beneficial. In perineuritis, such as sciatica and brachial neuritis, frequent application of electric light gives the best results. Ionization is sometimes of value, and if there is much pain salicylate ions should be used instead of iodine. Iodine may be given internally, and aspirin, phenacetin, or pyramidon for relief of pain. The local application of a mixture of equal parts of chloral, menthol, and camphor on gauze covered by oil silk is very helpful. Complete rest during the acute stage is necessary. In bursitis and teno-synovitis local treatment by electric light and ionization is indicated. In chronic villous synovitis where the above measures fail, the opening of the joint surgically and removal of the villous outgrowths has given good results.

PROGNOSIS.

Where a case of early arthritis is subjected to investigation and treatment on the above lines a complete cure can be effected. In cases of long standing the inflammatory changes are often progressive in nature and removal of the primary cause may do little good because the infective process is being carried on by a secondary intestinal infection. In such cases everything possible should be done to remove both the primary and secondary causes of infection, and when the signs of active inflammation in the joints have ceased measures should be taken to improve the mobility of the joints and muscular tone by massage and movements.

COCCYGEAL FISTULAE.

BY

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[*With Special Plate.*]

THERE is a type of fistula in the anal region which for years was a source of difficulty to surgeons, and still causes much embarrassment unless its nature is recognized. Fistulae of this type cannot be made to heal by the ordinary operative procedure, and failure to make them close is common.

They are always situated over the tip of the coccyx, or very close to it, and behind the anus. There is no internal opening, but frequently there are several external openings. The external openings are small, and discharge a thin serous fluid, or sometimes ordinary pus. The parts around are tender and often inflamed, and the condition causes the patient considerable discomfort when sitting, as the tender area is just at the point where most pressure occurs in the ordinary sitting position. The following case well illustrates the type:

A gentleman, aged 45, as the result, he thought, of a slight blow on the posterior part of the perineum, developed a painful abscess behind the anus. This abscess was opened and scraped by his medical adviser, but refused to heal. Another operation was then performed and the fistula laid freely open into the rectum, although no actual track could be found opening in this direction. After many weeks lying up and a further unsuccessful operation the fistula was still unhealed, and he was brought to see me. I recognized the nature of the condition and completely excised the fistulous area, after which healing took place without further trouble.

It is quite common to find, as in this case, that several previous operations have been performed without success.

Several years ago the late Mr. Goodall described a number of cases of fistulae over the coccyx, which were difficult to heal, but he did not recognize their nature.

The true nature of these fistulae over the coccyx was recognized by Sir John Bland-Sutton, and his book on *Tumours* contains (fourth edition, p. 436) a description of them. They are congenital—remnants of the faulty coalescence of the cutaneous covering of the back during early embryonic life. They are an exaggeration of the "post-anal dimple" often seen in this situation, and are in reality sequestration dermoids due to skin being shut off from the external surface. The fistulous tracks are lined with skin, and it is for this reason that they will not heal when laid open. In one case, on laying open such a fistula, I found a lock of hair nearly an inch long growing from the walls. It is a curious fact that they may exist for many years without causing any trouble.

The microphotographs accompanying this article show the appearances in cross section of the fistulous track after excision; it can clearly be seen that they are lined with epithelium. Often, of course, considerable modification has occurred in their structure from secondary inflammatory changes, but it will be always possible to demonstrate the presence of epithelial cells in the lining membrane of some part of the fistula. There is often a considerable deposit of fibrous tissue around the fistulae, even when no operation has previously been performed. When, as is usual, one or more operations have been performed, a very complicated condition may be found, but the situation of the external opening near the tip of the coccyx will generally make it possible to surmise the nature of the condition. Often the condition is not noticed until, as the result of some slight injury, a small abscess forms and the parts become painful. Treatment consists in completely cutting out the fistulous tracks. An incision should be made around the external openings and deepened until healthy fat is exposed; then the whole area is cut out down to the coccyx, care being taken to watch for any signs of side tracks, which are often present. The dissection will as a rule go down to the coccyx, and a fairly large wound will result. This is best left to granulate, and will soon fill in with healthy tissue. It is not necessary to excise the coccyx unless a fistulous track is discovered passing up in front of it, when, of course, the track must be followed to its termination.

These congenital coccygeal fistulae are closely related to the dermoid cysts sometimes found behind the rectum, but whereas the fistulae lie superficial to the coccyx, the dermoids are usually on the front or upper surface of the coccyx and between it and the rectum.

These congenital fistulae seldom cause serious trouble, and except as the result of surgical interference never open into the rectum. The chief point of interest about them is that owing to their being lined with skin they will not heal unless completely cut out.

ACUTE OSTEOMYELITIS OF THE LONG BONES IN CHILDREN.*

BY

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[*With Special Plate.*]

ONE cannot work in a children's hospital without being struck by the fact that there is always going on a certain waste of valuable human life, or at least of future efficiency and wage-earning capacity. This occurs in cases in which, through some delay in diagnosis or some unfortunate choice as to a method of treatment, there is lost

* A paper read before the Aberdeen Medico-Chirurgical Society.

the opportunity of saving a life or of putting a child in a fair way to become a useful citizen. The reasons for this are of course the suddenness with which acute disease begins in early life, the rapid course it so often runs, and the great variation of symptoms in any particular disease. These factors make diagnosis difficult for the practitioner, and the surgeon is too often presented with a case in which the indications as to the best possible line of treatment are none too clear. These observations apply, I think, most particularly to acute appendicitis, to empyemata of the thorax, and to acute (septic) osteomyelitis of the long bones. In the former two a great advance has been made in the last ten years, but I cannot help thinking that in the last neither as regards immediate recovery nor as to late functional capacity has there been a very great improvement in results as compared with the state of affairs when this was the subject of discussion at a previous meeting of this society (about ten years ago).

Although in a few cases the general infection is so severe, and the local response about the infected bone so slight, that diagnosis is practically impossible, usually there are some local signs which should lead us to suspect what is going on. While I fully appreciate the difficulties of diagnosis, it seems to me, from what I have seen of those cases as they come into hospital, and from a study of their histories, that there are two classes of cases in which undue delay in arriving at a diagnosis occurs:

(1) Cases in which a child has been ill for several days without any apparent cause, and a systematic examination of the ends of the long bones has not been made. This point has been constantly emphasized by Dr. Rose in all his teaching.[1]

(2) Cases in which, during an acute illness, an abscess has rapidly formed over the front of the tibia. A small incision has been made, and pus allowed to escape. The true nature of the condition has evidently not been realized, and home treatment continued until one or more of the other bones have been infected. These cases rarely recover.

On the other hand, whatever perfection we may arrive at in rapidity of diagnosis, the fact that the local disturbance may be accompanied or preceded by a severe septicaemia means that the initial mortality must always be fairly high until we can find some more prompt and efficient means of serum therapy than we are at present equipped with.

In cases that recover after operation there is always a great possibility of the functions of affected limbs being permanently impaired. This may be due to:

(*a*) Direct extension of infection to periarticular tissues or to the joints themselves.
(*b*) Infection of joints through the blood stream.
(*c*) Permanent loss of bone substance through destruction of tissues capable of forming new bone.
(*d*) Irregular growth, owing to interference with epiphyseal ends.
(*e*) Ineffective after-treatment where the whole thickness of the bone has been removed.
(*f*) Loss of muscle function from sepsis and from disuse.

The treatment of acute osteomyelitis must vary in some degree according to the type of case which we have to deal with.

While any attempt at classification must be faulty and subject to criticism, I feel, none the less, that if any attempt is to be made to indicate lines of treatment, this must be based on a consideration of the types of case, for in this way only can we hope, on the one hand, to avoid unnecessarily mutilating operations, and on the other, to apply sufficiently radical treatment when it is required. I think we may take it as a generally accepted fact that the process begins at the end of the shaft near to the epiphyseal junction. The only apparent contradiction to this is that one sometimes meets with a fairly acute form commencing high up in the shaft of the femur, but here the focus will be found to be close to an epiphyseal junction—namely, that of the small trochanter.

We may take it also that the so-called "subperiosteal abscess" described in the textbooks is in actual practice very rare, and that an abscess under the periosteum is almost invariably proved to have its origin in an underlying focus of infection in the bone itself.

Keeping these two points in view, and feeling the need of something to justify not advocating the same treatment in every case, I venture to submit the following rough classification into three types, and to discuss the treatment of each.

Type 1.

A case presents signs suggestive of localized mischief at the end of a long bone. The history is a comparatively long one, and the general infection is manifestly not at all severe. Incision reveals the presence of a localized collection of pus under the periosteum, which is separated from the bone only over the abscess area. Here removal of the bone denuded of periosteum will allow for drainage of the medulla, which should not be curetted out, and will—provided that all the denuded bone has been removed and given appropriate after-treatment—usually ensure a good result.

Type 2.

A short history, say twenty-four hours or less, of symptoms of severe general infection with strictly localized but very severe tenderness on pressure at one spot at the end of the shaft. On incision pus is not seen, but the periosteum has begun to separate, or is very easily separated, over the small area where tenderness was made out. When the bone is opened, which it should be freely, a little pus may be detected, but sometimes pus cannot be seen. If cultures be taken from the medulla, a vigorous growth of a staphylococcus, or a streptococcus, will result. In such a case, if treatment has been given at a sufficiently early point in the course of the disease, convalescence will be rapid and the final result good.

Type 3.

The most common type of osteomyelitis seen in hospital practice is that in which there is considerable denudation of periosteum. In some cases the bone will be free of periosteum in almost the whole length of one aspect; in others the stripping seems to have run round the shaft. In the most advanced stage the shaft is completely denuded of periosteum. This variety is only too familiar to us all, and it is the type most commonly met with in which disease of average severity has established itself in the shaft of a long bone.

The usual textbook teaching as to the treatment of those cases may be summed up as follows:

That a good-sized piece of bone should be chiselled out, and that this will amply provide for drainage of infected material, and will give the patient a good chance of recovery. More bone may be removed later if necessary; even the whole shaft may be resected, but if this is to be done it should not be undertaken for some time after, say about two months, in order to give time for new bone to form.

I submit that from the point of view of immediate recovery, and also looking to the possibility of obtaining the best functional result in the future, this treatment has not proved to be satisfactory, and I believe that the correct treatment is to resect (subperiosteally) the whole thickness of the shaft, not necessarily the whole length, but always the whole diameter of the part over which the periosteum does not exhibit a normal degree of attachment to the underlying bone—an operation previously described and strongly advocated to this society by Sir Henry Gray.[2]

While one has no hesitation in applying it to the humerus and to the femur in suitable cases, fortunately the bone for which this operation is most frequently demanded is the tibia, where, owing to the splinting afforded by the fibula and to the distribution of the muscle attachments, the conditions for operation, after-treatment, and for good end-results are ideal.

The arguments put forward against this apparently too drastic operation are:

(1) That it is not necessary, as if chiselling be freely done it is quite sufficient. This theoretically is true, but the practical difficulty is that it is very difficult to judge when one has chiselled away all the bad bone, and if any is left there is always risk of the infection spreading locally or to other bones. From what I have seen of this operation in the type of case under consideration, the results are not at all good, and a certain number of cases have ended by amputation.

(2) That resection is more difficult and dangerous than chiselling, and that the mortality from it is very high. In the past five years I have resected completely ten tibiae, with two deaths, and six partially, with two deaths. I do not think, when one considers the nature of the disease, that one can look for a much lower mortality than this.

(3) That the bone will not regrow. I do not think that in children one need have any fear of this. I have seen only one case in which growth failed, and one in which it was exceptionally slow. Usually the bone regrows in from three to six months. The bone seems to grow from the epiphyseal ends, and abundantly from the bone-forming cells adherent to the under-surface of the periosteum. A study of skiagrams taken at various stages of regrowth and examination of the limb itself shows this beyond dispute. This is apparently in contradiction to the experiments of Gallie and Robertson,[3] but their work as

regards this point is based mainly on animal experiments and on clinical observation made on adults. Great stress has always been laid on the value of inflammation as a stimulant to the activities of the bone-forming cells which get separated up with the periosteum. The finding I am tempted to deduce from my own cases is that while inflammation does, as pointed out by McEwan and others, promote the re-formation of bone in this way, where the sepsis has been very severe, or where pus under the periosteum has been kept too long under tension, the subperiosteal osteogenetic cells get completely destroyed—giving a possible explanation for the occasional case of failure of growth that occurs. Also that if a septic bone shaft be allowed to remain *in situ*, it may sometimes, by keeping up sepsis, act as a deterrent rather than as a stimulant to regrowth of healthy bone, and that therefore, after it has become septic, the quicker it is removed the better. If in any rare case bone growth should fail, one can always get over the difficulty by grafting bone from the other tibia, as I demonstrated by a case shown here recently.

(4) The last argument advanced against resection is that the limb is difficult to manage after, and that the functional results are poor. The after-treatment is certainly difficult, but it can be satisfactorily done, and the results can be judged from the cases shown. On the other hand, when incomplete operation has been done, and sinuses have continued to discharge for long periods, necessitating frequent secondary operations and prolonged hospital treatment, the results as regards the adjacent joints are notoriously bad.

In performing complete removal of the shaft of the tibia the end of the shaft which shows signs of least infection should be divided by a Gigli saw, or by a broad sharp chisel. The bone then can be usually lifted out, as the other end, at which the infection has commenced, is free, or is easily separated from the epiphysis. The periosteal bed is then cleaned up with a little peroxide of hydrogen or eusol, and is packed with gauze strips, which are kept in position by two or three temporary skin sutures. The operation can be performed very speedily. Secondary suture of the periosteum and of the skin is performed in three or four days, and Carrel-Dakin treatment commenced by tubes placed within the periosteum. The Carrel-Dakin tubes can be removed in a few days. The limb is immobilized and extended on a Thomas knee-splint.

Early active movement of the muscles is of the utmost importance in stimulating bone growth, and in helping to form a limb which is straight and free from deformity. The Thomas splint is to be laid aside whenever the shaft of the bone can be felt to have attained to any appreciable degree of firmness. For the lower limb a calliper splint will be used, and walking begun at the earliest possible time. Massage and faradism are of value in keeping up the tone of muscles, but active movement is most useful.

Although these remarks are, strictly speaking, applicable only to osteomyelitis in children, I would like to raise the question as to whether, taking into account the present position of bone transplantation, we might with advantage be less timid in our treatment of adult cases, as I think by so doing we might save more lives and get better results than we have done in the past.

Generally speaking, cultures from the medulla of the bone and a blood culture should be made in every case. An autogenous vaccine may be of value in after-treatment, and it is always of advantage to know if there is an active septicaemia present. Vaccines and serums, though of value as adjuncts to operative treatment, do not seem likely to be able to replace it unless in extremely mild cases.

The value of transfusion of blood from individuals who have been previously vaccinated with the particular organism concerned has been proved to be of value in certain septic cases,[4] but its use here as a routine treatment in acute cases presents obvious difficulties.

It seems, therefore, that the question of treatment hinges, at present, mainly on the type of operation to be performed, and I hope that by stating my own views, even at the risk of being considered too dogmatic, I may provoke some discussion and derive some help therefrom.

REFERENCES.

[1] *Scottish Medical and Surgical Journal*, 1906. [2] *The British Journal of Children's Diseases*, 1909. [3] *The British Journal of Surgery*, 1919. [4] H. J. B. Fry, BRITISH MEDICAL JOURNAL, February 28th, 1920, p. 209.

AT a meeting on April 13th of the Hospital Conference of New York City, representing forty of the leading hospitals, it was resolved to call the attention of Congress to the injustice that would be caused to charitable institutions by an increase in the tariff on surgical instruments, as proposed in a bill presented to Congress.

A CASE OF IDIOPATHIC MUSCULAR DYSTROPHY.

BY

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[*With Special Plate.*]

A MAN, aged 24, was admitted to this hospital in January, 1921, his invaliding disability being recorded as synovitis of the left knee.

His history was as follows. He enlisted early during the war, and served for some time at home. As far as he can remember he was perfectly well and of category A 1 until Easter, 1916. About this time he was accidentally kicked on the left knee by a horse. The injured part became swollen and painful, and he was resting at his billet and doing no duty for six weeks. He was not admitted to hospital. In about two months he was better and had very little trouble, except that he noticed his knee give way very occasionally when walking, and rather more often when the limb was under less deliberate control, as in running or in making sudden movements. He was put on fatigue work until he went to France in August, 1917, where he continued in a labour corps. Early in 1918 he fell in the street owing to his left knee giving way, and he dates his downward progress from this.

He was demobilized in February, 1919, and his attributable disability was recorded as synovitis of the left knee joint.

Shortly after returning to civil life he noticed wasting of the left thigh, and had pain in the back and in the left hip region. Tuberculosis of the left hip-joint was suspected, but *x*-ray examination proved negative. Shortly afterwards the right thigh muscles began to waste, and he found that walking became increasingly difficult. Going upstairs became a great task, and he has often been carried up by members of his family. Up to the time of admission to this hospital he had noticed nothing else wrong. Difficulty in walking, with wasting of the thighs and pain in the back, were his complaints. His general health he regarded as good.

Examination.

The patient is a rather thin, pale youth, who walks with the aid of a stick. His gait is clumsy, wide-based, and and waddling, with throwing out of the feet, and there is a noticeable lordosis even when he is fully dressed. Stripped he presents a typical picture of muscular dystrophy. The left knee-joint shows no signs of synovitis now and differs in no way from its fellow.

There is much wasting of both thighs. The atrophy, although he has not noticed it himself, has obviously extended to the buttocks and lower part of the trunk. The face, arms, hands, and the legs below the knees appear normal. There is profound wasting of both quadriceps, both sets of adductors, the psoas groups, the abdominal oblique muscles on both sides, and to a lesser extent of the hamstrings, glutei, and latissimus dorsi muscles, the serrati and the rhomboids. Both quadriceps on contraction show two or three ball-shaped relative swellings at intervals in the middles of the muscles. They are not strong enough to extend the legs at the knees. The tensor fasciae femoris on each side is hypertrophied and is used in a compensatory manner in extending the legs and in maintaining an erect posture. In raising the trunk at right angles to the lower limbs the recti abdominis apparently play a principal part, but he is obliged to call in the assistance of his arms. There is some relative hypertrophy, no doubt partly compensatory, of the spinati. He rises from the supine position in the typical "leg climbing" manner. *X*-ray examination of the hip-joints and spine shows no bony changes. The affected muscles show no fibrillary tremors; their electrical responses are diminished to both faradism and galvanism, but there is no reaction of degeneration and no myasthenic reaction.

The reflexes are normal except where profound atrophy of the muscles concerned prevents their elicitation. There is no dissociation of sensation—tactile, bone, joint, muscle, and temperature senses being unaltered. The other functions of the central nervous system also present no abnormality.

Apparently in this case there is as yet no evidence of familial affection. The patient has several brothers, all younger than himself, who are healthy.

Our reason for reporting this case lies in the fact that myopathy starting in the thigh muscles and described as the type of Leyden, Moebius, and Zimmerlin is of some rarity.

We have to thank Dr. C. E. Ligertwood, medical superintendent of this hospital, for permission to record the case.

ARTIFICIAL PNEUMOTHORAX.*

BY

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It is now some thirty years since artificial pneumothorax came into practical use in the treatment of pulmonary tuberculosis. During this period the roll of its adherents has steadily increased as its value has become more and more widely recognized, and the opposition which new methods always have to encounter, and which in this case has never been very strenuous, appears to have died down or disappeared. At the present time the treatment is practised in most of our sanatoriums, and in London the County Council have arranged to supply it to patients of the hospital class. As to the opposition it has encountered, such opposition as I have observed has shown itself rather in a studied neglect of the method than in open antagonism. Among those who have really investigated and practised the treatment I have neither met nor read of opposing opinions as to its value. This unanimity among the initiated has seemed to me nothing less than remarkable; for it is a treatment that involves no small amount of art and judgement, as well as some knowledge, and the success achieved might well be expected to differ, and differ widely, in the hands of various operators. If there have been any persistently "unlucky" centres, their fame has never reached my ears; and in this connexion it is important that the class of case treated be taken into careful consideration before any judgement is passed on results.

Those who reserve the treatment for advanced and otherwise hopeless patients may well find ill-fame in spite of the utmost skill; on the other hand, those who treat early cases by pneumothorax will achieve a success which they in no way deserve. The peculiarly individual character of each pneumothorax case, both as to the nature and amount of disease, and the varying features of the "gas pad" applied, defeats all efforts to classify the results; those who wish to convince themselves must do so on individual cases. The return to health of a single case of advanced unilateral disease under pneumothorax treatment will have an effect on their minds which statistics will neither increase nor diminish. I shall not, therefore, waste time now over the results, feeling that I shall open this discussion more usefully by inviting your remarks and criticisms over a wider field. If we achieve the best possible in the selection of cases and in the art of their treatment, we may safely leave the results to win a steady recognition for themselves.

Indications for Treatment.

First, as to indications for pneumothorax treatment—for the first essential to success lies in the proper selection of cases—these must miss on the one hand those who can recover by other means, and, on the other hand, those for whom a pneumothorax will merely mean acceleration of their inevitable end. Forlanini's dictum can, perhaps, hardly be improved upon. "Pneumothorax," he remarked, "is indicated every time that life is threatened by the extension of a local lesion." This is not to say, of course, that all such cases are suitable, since contraindications may exist, but in all such cases the question of a pneumothorax demands investigation. In practice it is surprising how many cases with disease of the whole of one lung turn up for this treatment. This is not, I am convinced, as a rule due to the negligence of physicians who have allowed disease to spread from apex to base before they awoke to the need of doing something. But disease in these cases is of hilus origin, has progressed in the deep parts of the lung, and on reaching the surface is soon evident to auscultation over the whole of one side. In such patients the *x* rays will often discover advanced disease of the opposite lung also, though to the stethoscope it may appear quite sound because the process has not yet reached the surface. For this reason it is imperative, where at all possible, that a radiogram be taken before a pneumothorax is embarked on, for above all other considerations the condition of the other lung is the point of the most moment. How much disease may be permitted in the other lung without its forming a contraindication to pneumothorax is a matter which cannot be described on paper, and is often very difficult to decide upon in practice. In my experience the question of activity is of far greater importance in this decision than extent or locality of disease. Rarely is the other lung altogether free of disease unless in pneumonic cases, and in these, nevertheless, the prognosis is bad. But torpid lesions, even of wide extent, may be expected to clear up or improve—the strain of increased function seems to be more than counterbalanced in these cases by the removal of focal reactions and toxaemia, and the effects of the hyperaemia which is probably brought about. Active lesions, on the other hand, tend to spread and get worse. But even to this there may perhaps be exceptions. Many writers, notably to my recollection Mary Lapham, and Parfitt and Crombie, have recorded improvement and recovery under pneumothorax in cases where the other lung was so bad as to appear to be a contraindication. In some of these the *x* rays were not used till after the pneumothorax was initiated, and the writers are therefore inclined rather to discount the *x*-ray findings in deciding on the suitability of a case. Nevertheless the *x* ray must be our standby, and if we are to extend our field of treatment to cases of more doubtful suitability it can only be through increased experience of the radiological appearances.

Conducted Râles.

One of the warnings I should like to make while speaking on selection of cases is against mistaking conducted sounds for evidence of disease in the better lung. Sharp consonating crepitations are nearly always audible on the opposite side near the spine, and not infrequently about the axilla, though, curiously enough, they may be less plainly heard in some cases in the area between these points. Often a pneumothorax will unexpectedly remove sounds in the functioning lung, and frequently, I am sure, these sounds have been merely conducted. Crepitations at the base or round the heart on the good side are not always, I think, a contraindication to pneumothorax, where the *x* rays show only quiet peribronchial disease. Such signs may clear as treatment progresses. In cases where the better lung is of doubtful reliability a waiting period of complete rest may improve matters; but in other cases the chance of doing a pneumothorax may, through waiting, pass by and be lost.

Intervals and Quantity of Gas.

To pass over the initial operation, regarding which I have nothing new to remark, and to come straight to the pneumothorax already induced, I should like to refer to the intervals between refills, and to the quantity of gas it is wise to introduce. I find a tendency in this country to give larger fillings, and hence at longer intervals, than are advised by the most experienced Continental authorities. For example, Forlanini in Italy recommended only 200 to 300 c.cm., rising at most to 500 c.cm. at each filling; Dumarest in France rarely leaves longer than three weeks between refills, unless in cases of thickened pleura; Brauer and Spengler, in Germany and Switzerland respectively, advise 400 to 800 c.cm. In this country fillings of 1,000 c.cm. or more seem to be approved of, and one authority teaches, I am informed, that the intervals achieved should be one month in the first year, two months in the second year, and three months in the third year of treatment. This has led, in one case I believe at least, to the need for two refills on consecutive days before the pneumothorax could be re-established at its former volume and pressure. Such a release of collapse seems to me very undesirable, and is condemned on grounds of *post-mortem* experience by some of the best authorities.

Personally, I have found that it is not possible to fix any standard interval between refills, but each case must be a

* Opening paper in a discussion at the Royal Society of Medicine on May 24th, 1921.

law unto itself. For it may happen in one case that a weak mediastinum prevents our achieving complete collapse of the lung, with the result that gas absorption is rapid, and the intervals have to be short—as in a case of mine who can at most achieve a two and a half weeks' interval in the fourth year of treatment; or, on the other hand, pleurisy may early limit absorption and permit of long intervals even near the outset of treatment—as in another patient, whose pneumothorax was started last July, and who has received but 1,120 c.cm. of gas, in two refills, since November last. In my experience it is not wise to let refills run above 700 or 800 c.cm., and in most cases 500 c.cm., or even less, is a preferable amount. The selected quantity will, of course, determine the interval, and this will be long or short according to the rate of absorption. But, quantity of gas apart, a long interval may allow of expansion and attachment of an imperfectly collapsed lung, as happened in the case of weak mediastinum quoted above. This patient was persuaded on one occasion to lengthen his interval to one month, with the result that the lung became adherent to the chest wall in two places. The doctor who made this recommendation was unaware that the lung, though out of reach of the stethoscope, was but imperfectly collapsed at such pressure as could be used,—a fact which was only revealed to *x*-ray examination.

Pleural Sclerosis.

There is no doubt that the *x* rays are a wellnigh indispensable adjunct to treatment, alike in the fixing of the optimum pressure at the outset, and also in the readjustment of this at intervals during the course of treatment. In process of time, even apart from the occurrence of definite pleurisy, the pleural layers undergo a chronic inflammatory thickening, followed by contraction, and the mechanical conditions in the chest are thereby altered. Where the heart has been pushed far over to the opposite side it may be seen to return towards the pneumothorax, and therewith the lung may show a tendency towards re-expansion. Under these conditions the interpleural pressure must be steadily raised or the heart and lung will become attached to the chest wall and treatment be interfered with. This readjustment of pressure is a point which must be constantly in mind as treatment progresses. In some cases of pleural thickening, and particularly after purulent pleurisies, no amount of pressure will prevent gradual closing up of the cavity and re-expansion of the lung. In such patients, nevertheless, the expected disaster does not always materialize, for the pleural fibrosis may spread through the lung itself, and healing be thus brought about.

Weak Mediastinum.

Another side to the problem of intrapleural pressures is that concerned with weak mediastinum and with ballooning of the pleura. Mediastinal over-displacement may be difficult to discover without *x*-ray examination, for the manometric signs described by certain writers (slow rise of pressure, with stationary points, and small fluctuations) are not, I think, of much value. The symptoms may be vague, and the position of the heart may not appear to be unduly altered. As a matter of fact, the same amount of displacement may be borne without discomfort in one patient but cause marked symptoms in another. The symptoms may amount to vague discomfort, with ill-defined distress and inability to sleep, or pseudo-asthmatic symptoms may appear, with dyspnoea, an audible wheeze, and attacks which may be of a very alarming character. All these symptoms disappear as soon as their cause is recognized, the pressure lowered, and the mediastinum allowed to recover its tone. In these cases, and in some others where the displacement is less striking, crepitations may appear at the opposite base and may continue for months or years. They are an indication for a lowering of pressure, but such lowering may be impossible without allowing the lung to expand. Where the signs have, from necessity, been allowed to remain I have not seen any harm result from their presence. They represent presumably an oedema of the lung base in most cases, but in some the dryness of the sound, and its appearance or increase immediately after a filling, suggests mere atelectasis as the explanation. In two of my cases, also, I have experienced a definite lung oedema with frothy sputum during the early stages of treatment, owing to circulatory embarrassment in the better lung.

Inflamed Pleura and its Treatment.

A condition which seems to tempt operators to a raising of pressure—always, I am sure, to the patient's harm—is the onset of pleurisy. This is illustrated by a chart, among many I have seen, which came under my notice a few days ago. At the sixth injection the pressure was raised for the first time to the modest figure of $-3+2$; four days later fluid was found, and the pressure was $+1+8$, and yet 40 c.cm. were put in and the pressure raised to $+3+9$; at a later stage in the same case a return of fluid is noted, and the same increase of pressure was instituted, though it had been kept low in the interval. I do not regard this as a rational procedure, but agree with Continental observers that we should hold our hand, and even avoid puncture altogether, during the earlier stages of pleurisy, since such interference may aggravate the inflammation. Moreover, it may lead, as I have seen in these cases, to troublesome displacement of the mediastinum. There is, fortunately, no need for puncture during the early stages of pleurisy, since gas absorption almost ceases, but it is, I fancy, the small amount of gas which can be put in that tempts those who do puncture to raise the pressure. The loss of resilience due to inflammatory congestion must not be confused with the stiffness of chronic thickening, in which condition, of course, high pressures can and should be employed.

"Ballooning" of the pleura towards the healthy side at certain weak spots, and particularly in front under the sternum between the first and fourth rib articulations, is an occurrence which is quite common, but has not attracted a large amount of attention. It reveals itself by giving the physical signs of a gas pocket, and is generally visible to *x* rays as an elliptical encroachment on the healthy side with a visible sharp border. I have so far seen no harmful results accompany this occurrence.

Surgical Treatment of Adhesions.

A subject of the greatest moment, in that it promises to open a doorway from pneumothorax treatment into wider fields, is the surgical treatment of adhesions and especially of adherent pleura. Localized adhesions, if solitary or few, can be divided without opening the chest by the galvano-cautery or with a tenotome. Jacobaeus's method consists in the introduction of an instrument called the thoracoscope, with which the adhesions are visualized, and thereafter in the introduction of a cannula in the neighbourhood of the adhesion, and its severance by a galvano-cautery introduced through the cannula. The technique is difficult, but a good deal of success has attended its use in skilful hands, as may be gathered by an article by the Norwegian Holmboe in the October, 1919, number of *Tubercle*. Division of adhesions with a tenotome has been practised by Morriston Davies in this country, the operation being carried out under the *x* rays.

For cases where a few strong adhesions are preventing treatment one or other of these methods may succeed; with multiple adhesions I am inclined to think opening the chest may prove a more satisfactory procedure.

About a year ago, in a private patient for whom I produced a pneumothorax, the lung failed to collapse adequately owing to the presence of numerous firm adhesions to the chest wall. Persistent low pressures did not lead to their stretching or separation, and higher pressures were barred on account of the presence of large and numerous cavities which I feared might be torn open. Recently the condition was becoming less and less satisfactory owing to the further shortening of the adhesions as the result of chronic pleural inflammation and fibrosis. Some three weeks back Mr. Romanis at my request opened the chest wall through the third space, and divided, with scissors and galvano-cautery, seven strong adhesions, mostly rounded bands, but one with a fairly wide attachment. This allowed the lung to collapse, which it did to a moderate degree only, being solid with disease. The actual operation took twenty-three minutes, was done under gas and oxygen only, and no rib resection was contemplated or performed, an ample opening being obtained between the spaces with special retractors. The operation led to very little reaction or other disturbance, except for the expected temporary increase of sputum. A refill was given on the seventh day and again on the twelfth, and all seems well save for doubts as to the ultimate behaviour of the functioning lung.

Separation of Adherent Lung.

Of recent years the separation of lung adherent over a larger surface to the chest wall has been attempted on various occasions. In 1918 Professor Schottmüller, of Hamburg-Eppendorf, described how he advised the trial

of this for a case in which Jessen had found the pleural surfaces adherent. Jessen refused to attempt it, but Sudeck removed most of the fourth rib and separated many adhesions by hand, and a good result was recorded. Eden of Jena, stimulated by this, operated on a case, but found the surfaces very difficult to separate, and had to confess that the pneumothorax obtained was only partly intrapleural. Some days later the patient ruptured a lung cavity during the act of coughing. Ulrici also treated a case by this means, but the operation lasted one and a half hours, and the patient succumbed eventually to extension of disease in the opposite lung and other organs. I cannot feel that the separation of adherent pleura, apart from well-defined bands, by surgical means, is at all a sensible proposition, and fortunately there appear to be other possibilities.

Stripping the Costal Pleura: Tuffier's Operation.—Just a year ago I got Mr. Romanis to strip the parietal pleura from the endothoracic fascia over the apex (apicolysis) in a private patient who suffered with a bleeding cavity, and to pack the resulting space with solid paraffin. I was so much impressed on this occasion with the ease with which the parietal pleura stripped, and with the comparative mildness of the operation, done under gas and oxygen and without rib resection, that I felt encouraged to try it in other cases where adherent pleura prevented the production of pneumothorax. Not long after this I came upon a paper by Rieckenburg, working under Ulrici at Sommerfeld, in which he describes two cases of adherent lung where the costal pleura was stripped from the chest wall, and a pneumothorax maintained outside it. He points out the value of the double covering over large cavities in diminishing the danger of perforation, and notes that the raw pleural surface in healing contracts down and prevents further expansion of the lung. The cavity holds gas only under low pressures at first, but eventually it becomes effectively "gas-tight." Encouraged by the possibility this offered, I asked Mr. Romanis in January last to strip the whole costal pleura in a case eminently suitable for pneumothorax, but with total adhesion of the pleural surfaces. The patient had chronic disease of the whole right lung with cavitation, and ran fever to 100.5° in spite of prolonged rest. The left lung was an excellent organ. The chest was opened through the third space, and the pleura separated with the hand over all but the inner surface of the lung. Ample room for insertion of the hand between the ribs was obtained by strong retraction, and the pleura stripped with the greatest ease, but the lung collapsed little as it was solid with disease. The operation lasted but twenty minutes, and was followed by very little shock or reaction. It was realized that the absorption of air would be rapid, but I thought a week could be left before the refill. Most unfortunately, however, the patient only came into my hands again after an interval of twelve days, and by then all the air was found absorbed and the lung re-expanded. It would be wiser, I think, in such a case to leave a small opening to the outer air, and to close this at the end of a week, when refills can be conveniently substituted. The sequel in this case was interesting, for the temporary immobilization of the lung allowed the patient to re-establish tolerance, and the temperature fell to 99° and has remained there; at the same time both lung and general condition have improved. This improvement is reminiscent of some experiences of Schroeder, who found lung fibrosis and recovery to follow a severe traumatic pleurisy in three cases where he attempted, without success, to separate adherent pleural surfaces after a pneumothorax operation by Brauer's open method.

Extrapleural Thoracoplasty.

I have referred to the possibility of thus creating and maintaining an extrapleural pneumothorax because the idea may be new to some of those here present. Of the better recognized means of dealing with adherent pleura, by extrapleural thoracoplasty under local anaesthesia, I shall not here speak, but I hope some others now present may do so. Two admirable papers on this subject by Scandinavian authorities appeared in our journals last year, one in *Tubercle* of April, 1920, by Saugman, dealing with 41 cases, and one by Bull of Christiania in the *Lancet* of October 16th, 1920, with an account of 37 cases. The results appeared to be excellent, and the actual operation mortality small, amounting to but 4 cases in each series.

With regard to all these surgical procedures, it must be noted that operations are not to be lightly undertaken in the subjects of pulmonary tuberculosis; the cases require even more careful selection, especially as regards the condition of the better lung, than they do for mere pneumothorax treatment. Before leaving the subject of adherent pleura I should like to insist that no operative measures must be undertaken for its relief until its actuality is determined by experiment. It might well be supposed that where a great displacement of organs and closing in of ribs has occurred, we are then necessarily dealing with adherent pleura. But this is by no means the case, as I can illustrate by a radiogram from a patient on whom I induced a pneumothorax some three weeks ago. The heart was entirely in the right chest, and the trachea was drawn over and distorted; and yet the pleural surfaces proved un-adherent, with the result, as would be expected, that the intrapleural pressure had fallen to a very low figure—actually to −27 −25 cm. of water.

Pneumothorax treatment is a big subject, because it involves so many possibilities. What I should like finally to insist on here is the comparative narrowness of its indications, but its striking hopefulness within these limits. All is possible to a case of unilateral, or practically unilateral disease, if only we are sufficiently persistent. It is for that reason that I have wandered to-day into the byways of surgical interference, feeling that in these cases adherent pleura is no excuse for folding our hands and giving in. The patient with one lung has a good fighting chance if only our skill and resourcefulness suffice to discover for him the road to victory.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

THE DESTRUCTION OF BACILLI BY ELECTRICITY.

IN 1915 I started some experiments for the destruction of bacteria by electricity. Pus from a streptococcal abscess was collected in a sterile copper vessel; cultivations on agar yielded a virulent streptococcus. After passing a continuous electric current of 100 milliampères through the pus for an hour no growth was obtained on agar, but at the bottom of the copper vessel I found a deposit of copper salts sufficient to kill the most virulent streptococcus.

I next tried an electric bath with a carbon pole. I had a patient with a very bad septic forearm, which did not improve with free drainage and antiseptic treatment. I obtained a large porcelain arm bath, filled it with 10 per cent. saline solution, and put one carbon pole at one end of the bath; I made the patient's septic arm the other pole by attaching a zinc plate to his shoulder and allowing him to rest the limb in the warm saline solution. I now passed 80 milliampères continuous current through the bath and left the arm in it for half an hour. The following day the arm looked very much cleaner and the granulations much healthier. Each day it improved, and within about ten days with daily baths it was almost healed. I discussed the treatment with my colleagues, and we agreed that in all probability the improvement was due to free chlorine gas, which was being liberated by the electric current passing through the saline solution. I was, however, struck by the rapid growth of healthy granulation tissue, which I was convinced was stimulated by the current.

From 1917 to 1919 I continued my observations at the Norfolk and Norwich Hospital, and there treated a number of gunshot wounds with septic sinuses by means of copper sulphate ionization. The sinus was cleaned out and filled with a 1 per cent. solution of copper sulphate. A copper rod was then put down the sinus and a zinc pad placed on the patient's back. The two poles were connected respectively to the anode and cathode of a galvanic battery and a constant current of about 8 milliampères passed through for about fifteen minutes daily. The rapid healing of the wound was marked by the rapid growth of granulation tissue.

In an attempt to prove that the electric current actually played a part in the destruction of organisms I constructed an apparatus by which the current passed through some pus, but the poles were not in it. By this means the gas given off at the pole could not play a part in the destruction. I obtained a glass vessel, divided into three compartments by plates which would conduct the current. I placed some pus laden with *Staphylococcus aureus* in the middle compartment and the positive pole into one and the negative pole into the other of the two remaining compartments, which were filled with normal saline. A current of 50 milliampères was then passed through for half an hour at 70° F. By incubation on agar for eighteen hours a very small growth of *Staphylococcus aureus* was obtained. The current was allowed to continue running

through the pus for another hour, at the end of which time a further culture was taken and after forty-eight hours' incubation no growth could be seen on agar.

In 1915 I introduced into the out-patient department of this hospital electric baths for sepsis, and they have been used daily ever since with success.

Recently I have tried the same experiment with pus containing *B. coli*, and found it took a current of 80 milliampères for one hour to kill the organisms. Based on the results of my recent investigations I am convinced that in introducing electric baths to combat sepsis I was not only introducing a means of stimulating granulation tissue and of cleaning the wound but an actual means of destroying the organisms infecting it.

For valuable help in examining the cultures and for advice on many points I am indebted to Dr. H. M. Galt, pathologist to this hospital.

P. C. COLLINGWOOD FENWICK,
Senior Resident Surgical Officer, Royal Sussex County Hospital.

ENTERO-COLIC INTUSSUSCEPTION IN AN ADULT.

W. B., a pale, thin man aged 46, who for the previous four months had been subject to occasional abdominal discomfort but who had otherwise always enjoyed good health, was suddenly seized with severe abdominal pain at 7 a.m. on February 16th, 1920. The pain was intermittent, of increasing severity, and accompanied by retching and occasional vomiting. Shortly after the onset of symptoms the bowels were twice moved and flatus passed.

When first seen, at noon, a rounded, prominent swelling, almost as large as a cocoanut, was visible in the right iliac region; it was dull on percussion and tender on palpation. The area of greatest tenderness as also of pain, however, was below the right costal margin and in the epigastrium.

His wife volunteered the statement that during a paroxysm of pain, whilst pressing on his abdomen to ease him, she heard a "click," and immediately afterwards discovered the swelling. He was sent to the Victoria Cottage Hospital, Woking. When admitted half an hour later he was collapsed; the temperature was 96.4° and the pulse 64.

Operation.

At 2 p.m. the abdomen was opened through the right rectus sheath; enormously distended and congested large bowel exposed; tracing this in both directions it was found that the ascending colon, as far as the hepatic flexure, the caecum, and about 6 in. to 8 in. of ileum were distended by intussuscepted small bowel. At the apex of the intussusceptum an oval mass about 2 in. long could be felt, suggestive of a polypus. The intussusception being irreducible, and total excision, owing to the patient's condition, holding out little prospect of success, the ileum above the intussusception was laterally anastomosed to the transverse colon and the abdomen closed. He had only slight post-anaesthetic vomiting.

After-History.

Next morning he complained of a good deal of abdominal pain, nausea, and frequent hiccough, and became faint when moved. The temperature was 100.2° and the pulse 110.

On February 18th the temperature was 99.6° and the pulse 76; there was some increasing abdominal distension. A turpentine enema was followed by severe collapse; the motion consisted of altered blood. On the next day the bowels had moved several times in response to repeated doses of magnesium sulphate and the general condition was improved. The temperature was 100.4° and the pulse 84. From this time onwards the patient's condition steadily improved; pain, nausea, and hiccough gradually subsided; the bowels were moved daily; the appetite returned and the pulse improved, but the temperature remained constantly between 99° and 100°. On February 26th he complained of severe griping pains, and the following morning had desire to go to stool and passed the entire intussusceptum. The temperature fell to normal five days later and he made an uninterrupted recovery. He was discharged from the hospital on March 23rd and has remained in excellent health since.

Owing to advanced decomposition it was not possible to make a satisfactory examination of the intussusceptum. It was about 18 in. in length, the lower end (apex) apparently terminating blindly and containing thick (? faecal) material. No tumour was detected.

The appearance of the specimen and the distance of the starting-point from the caecum suggest that a Meckel's diverticulum may possibly have been the cause of the intussusception. That it was entirely irreducible seven hours after onset was, no doubt, due to the large amount of mesentery contained. The comparatively slight constitutional disturbance after the first few days is noteworthy.

I am indebted to Dr. F. M. Haig, who administered the anaesthetic, and to Dr. F. E. A. Colby, who assisted me in the operation.

Woking. B. H. KINGSFORD, M.D.Lond.

British Medical Association.

CLINICAL AND SCIENTIFIC PROCEEDINGS.

LEEDS DIVISION.

A SUCCESSFUL meeting of the Leeds Division was held in the Leeds Township Infirmary on May 19th. In addition to the ordinary business, papers were read and cases and specimens were shown.

Graphic Methods in Cardiac Diagnosis.

Dr. T. WARDROP GRIFFITH gave a lantern demonstration to show the use of the graphic methods of studying affections of the heart. At the outset he emphasized the view that all the more recent methods, such as the use of the polygraph and of the electro-cardiograph, should be regarded as supplementary to and not as superseding the ordinary methods of examination. The more he used these instruments the more he found he was able to dispense with their use. It was, however, owing to the researches of a large body of workers, using these instruments, that the knowledge of cardiac disease and of cardiac affections had advanced. There were many men who with great facility made an accurate diagnosis of fibrillation of the auricle on the recognition of a non-rhythmical action of the heart, and who forgot, or seemed to forget, that their ability to do so depended entirely upon the work of Sir James Mackenzie, Dr. Thomas Lewis, and those who, like Professor Cushny, had paved the way by experiments on animals.

In the course of his demonstration Dr. Griffith dealt with those temporary interferences with auriculo-ventricular conductivity which sometimes occurred in pneumonia, and gave an account of one case in which some impairment of conductivity was accentuated by the use of digitalis, a drug which, however, had probably saved the life of the patient. Another instance was given of a lad with impaired conductivity, in whose case the impairment was abolished by the use of atropine, only to return in a few hours, but in which conductivity was found to be normal at the end of two years. Examples of different degrees of block leading up to complete disassociation were shown.

Leucocytic Changes in Hodgkin's Disease.

Professor STEWART read a paper on the leucocytic changes in Hodgkin's disease and their diagnostic significance. He said that the leucocytic count in Hodgkin's disease was very variable, not only in different cases, but in the same case at different times. Deviations from the normal were most marked in acute and subacute cases. There were three chief types of leucocytic changes—in order of frequency: (1) a neutrophil leucocytosis, relative and absolute; (2) a relative and absolute increase of the large mononuclear cells, not lymphocytes, especially of the transitional type; (3) a relative and absolute eosinophilia. Any one of these three, if well marked, was of some value in the differential diagnosis of a suspected case of Hodgkin's disease, but No. 2, a large mononucleosis, mainly of transitional type, was the only one on which much reliance could be placed. In 8 recent cases in which the diagnosis of Hodgkin's disease was established by histological examination of an excised gland or glands, 3 showed this large mononucleosis, varying from 19 to 33 per cent. (absolute figures, 1,430 to 3,370 per cubic millimetre). The normal figures for large mononuclears (including transitionals) might be taken as from 4 to 10 per cent., or about 240 to 900 per cubic millimetre in absolute figures. Two other cases showed a high neutrophil leucocytosis (20,000, with 95 per cent. polymorphs; and 33,000, with 89 per cent. polymorphs). In a third case there was a terminal relative neutrophilia (9,000 leucocytes, with 96 per cent.

polymorphs). In none of the 8 cases was there a blood eosinophilia, even when the glands were overrun by these cells, as was the case in several. Other observers (Peyzer, Tonycope, etc.) had recorded cases in which a general eosinophilia was present. An absolute lymphocytosis was quite exceptional, although there might be a relative excess of these cells when, as not infrequently happened, a leucopenia existed. While the examinations of the blood might therefore, in certain cases, aid in the diagnosis of Hodgkin's disease, the excision and microscopic examination of a gland still remained the only thoroughly reliable method of establishing the diagnosis.

Post-Operative X Rays in Breast Cancer.

Dr. ROWDEN read a paper on the post-operative *x*-ray prophylactic treatment of malignant disease of the breast. He said that the operation for malignant disease of the breast was generally disappointing, owing to the large percentage of recurrences locally, and mostly within twelve months: with post-operative *x*-ray treatment local recurrence was unusual; without *x*-ray treatment death was not usual without local recurrence. Dr. Rowden expressed the opinion that *x*-ray treatment of malignant breast without operation was quite unjustifiable, nor was *x*-ray treatment immediately before operation justifiable. Radiation had a marked paralytic effect on growing and young cells, but the rays were rapidly filtered out in passing through tissues, and therefore could not affect a growing cell deeply placed without injuring the overlying tissues. After operation the condition was more favourable for the use of *x* rays as the cancer cells are near the surface. A short and active treatment was advisable. Dr. Rowden suggested to the surgeon: (1) Early operation; (2) to leave no raw surface—a raw surface appearing to favour local recurrence; (3) to order the rays two weeks after the operation, six to eight weeks after operation was too late. Dr. Rowden gave the following statistics of 21 cases with completed treatment up to three years ago since 1909. Of these cases there has been only one local recurrence five years after operation.

15 are living; all well except the case of recurrence.
5 have died:
- One 9 years after operation—disease in mediastinum;
- One 16 months after operation—disease in spine;
- One 17 months after operation—disease in mediastinum;
- One 2¾ years after operation—mediastinum and neck;
- One 2½ years after operation—mediastinum and neck.

1 cannot be traced.

Dr. ALLAN showed pathological and surgical specimens, also some surgical cases.

Reports of Societies.

ARTIFICIAL PNEUMOTHORAX.

AT the meeting of the Section of Medicine of the Royal Society of Medicine, on May 24th, Dr. A. F. VOELCKER presiding, Dr. CLIVE RIVIERE read a paper on artificial pneumothorax, which is printed in full at page 810.

In the course of the discussion following the paper Sir JAMES KINGSTON FOWLER described the first case in his experience in which artificial pneumothorax was performed for the relief of haemoptysis. This was in 1885, when a patient was admitted to Middlesex Hospital, and within thirty-one days had twenty-one severe attacks of haemoptysis, and brought up 196 ounces of blood. It was then decided to make an incision in the thorax and induce, if possible, collapse of the lung by this method. The operation was performed, and the lower lobe collapsed to some extent. There were two attacks of haemoptysis subsequently during the five days for which the patient lived, and about 10 ounces of blood were brought up. It was found that there were adhesions which prevented complete collapse. It was quite impossible to have saved the man's life; but, despite the imperfect methods then employed, he thought it might be claimed that even at that time there was a measure of success. In the first place, there was very little haemorrhage after the operation compared with the great amount that had taken place before, and the lung underwent a certain degree of collapse, which would have been complete had it not been for adhesions. He considered that the introduction of artificial pneumothorax was one of the great advances in treatment within his long experience.

Dr. VERE PEARSON thought that there was still too much diffidence in advising or undertaking this operation. Experience had taught him that it was quite impossible to tell beforehand with the help of *x* rays or any method of examination whether adhesions were present which were going to prevent pneumothorax. He now abandoned the procedure if he failed after two sittings at each of which he punctured perhaps three times. He had also given up attempting, in cases with a good many adhesions, to break these down in the early stages by increasing the pressure; such cases failed to do well. It was in one such case that he came across an indication of gas embolism. The other bugbear was pleural reflex; he had had two cases with very alarming symptoms, which he put down to that condition. He found that the liability to the outpouring of fluid did not vary materially whether the pneumothorax was complete or partial. In conclusion, he felt that there was a hiatus between the surgeon and the physician which ought to be bridged.

Dr. NEVILLE COX, speaking from his experience at Midhurst, also appealed for more help from competent surgeons, and said that every large sanatorium should have a properly equipped operating theatre with a surgeon prepared to deal with these cases. He instanced also two points of technique—the first, that the use of a pointed needle for the first injection should be avoided, for it must be a matter of luck rather than skill if there was not a puncture of the lung; the second, the inadvisability of using tuberculin in after-treatment.

Dr. DONALD HALL was convinced of the great value of the treatment. There must be in this country hundreds of cases left to die because it was denied. The treatment did not receive from the profession as a whole the the recognition which was its due. For this neglect there might be several reasons or excuses, among them ignorance, lack of material, timidity, and the strain which the treatment imposed on patient and physician. Cases must be selected with the greatest care, but he thought that for pulmonary tuberculosis with excavation artificial pneumothorax at present held the field.

Dr. JANE WALKER said that at the East Anglian Sanatorium this treatment had been applied in 117 cases, and there had been failure to produce pneumothorax in about 10 per cent. A certain amount of mischief in the other lung was not a contraindication, and in a large number of cases, with the general improvement in the patient's condition, a diminution of the signs in the other lung had taken place. So far there had been no serious accident, except that occasionally a vein had been punctured. The simplest possible form of apparatus was used, and the only modification which had been made since this treatment was first practised was that air instead of nitrogen was used. She thought that the time had now come to consider whether this method of treatment should not be applied to cases before they became so severely ill. In all these cases the artificial pneumothorax was induced as the last hope, and although the percentage of recoveries was comparatively low, life had been made more bearable for many.

Dr. C. S. BURRELL thought that the spacing of the refills was of the greatest importance. Unless they took each case individually and refilled at intervals which were found suitable in each instance, they were not likely to be successful. He agreed with the method of giving a small quantity of air at frequent intervals, the maximum interval being a month.

CAUSES, PROGNOSIS, AND TREATMENT OF STERILITY.

AT the meeting of the Section of Obstetrics and Gynaecology of the Royal Society of Medicine held on May 5th, with Professor HENRY BRIGGS, the President, in the chair, Dr. ARTHUR GILES opened a discussion on the causes, prognosis, and treatment of sterility. He said that he proposed to touch on two of the general aspects of the subject—the prevalence of sterility, and the responsibility of the male partner—and then to sketch out three types of sterility in women, viewed from the standpoint of pre-

gnosis and treatment—namely, (*a*) inevitable and incurable sterility, (*b*) functional sterility, and (*c*) conditions that caused or favoured sterility, but allowed of treatment. Estimates of the proportion of infertile marriages varied widely with different authors and in different countries. Some, like Frank and Burdach, placed it as low as 2 per cent.; others as high as 20 per cent. He had endeavoured to form an estimate from his case papers, with the result that he thought it was a sound deduction that the proportion of sterile marriages in this country was well below 15 per cent. Dependence upon figures given by various writers was weakened by the fact that in some statistics stillbirths were taken into account while in others they were not. Of published estimates he was disposed to regard those of Simpson as being nearest to the truth; he found the proportion of unfruitful marriages to be 10.9 per cent. in village communities, and 16.3 per cent. in families of the aristocracy. The ratio was probably higher in towns than in the country.

It was not sufficiently realized that in many cases the woman was not at fault. Estimates again varied widely as to the proportion of cases in which the husband was to blame. The actual figures were of less consequence than appreciation of the fact that in a childless marriage the woman might not be at fault, because it had an important practical corollary that in doubtful cases the wife should not be assumed to be responsible and submitted to operative procedures without obtaining definite evidence that the husband was healthy. It would be all the easier to recognize the cases of incurable sterility if the conditions necessary for successful impregnation were remembered. They were: On the man's part, ability to deposit healthy seminal fluid in contact with the os externum cervicis; on the woman's part, (1) ability to receive this fluid in contact with the cervix; (2) such a healthy condition of uterus, tubes and ovaries as would enable the spermatozoa to travel up to meet the ovum; (3) the production and discharge of healthy ova; (4) such a healthy condition of the uterus as would enable it to harbour the fertilized ovum.

1. The conditions under this head that caused sterility were absence of the vagina and want of communication between the vagina and the uterus. It might be necessary to undertake a dissection of the parts before the point could be cleared up. When the vagina was absent the question might arise whether an artificial one should be made. From the point of view of sterility the procedure would be hopeless. Whether it should be done in order to make married life possible was another matter.

2. This condition was unfulfilled in the case of absence or marked under-development of the uterus, congenital atresia of the tubes, and occlusion of the tubal channel by inflammation. Pyosalpinx, which was due to gonorrhoea in about 95 per cent. of the cases and to tuberculosis or *Bacillus coli* infection in the remainder, certainly caused incurable sterility.

3. For conception to be possible the ovary must produce healthy ova, but it was very difficult to say when it was not doing so. Age and the action of *x* rays led to ovarian atrophy, and it might be presumed that when this atrophy had come about ovulation ceased. But there were other conditions that apparently interfered with normal ovulation—for example, anaemia, chronic taking of drugs such as morphine, certain febrile conditions and some nerve conditions, including pituitary disease. Obesity might come into this category. The factors that disturbed normal ovulation, or the influence, if any, of internal secretions on ovulation, were unknown. It would not be unreasonable to assume that the physical and chemical causes of defective ovulation acted by interfering with the nutrition of the germ cells.

4. This condition was not strictly one upon which successful impregnation depended, since failure therein led to miscarriage, not to sterility. From this point of view, however, the cases that were hopeless and incurable were those of uterine tuberculosis, carcinoma and sarcoma of the body of the uterus, and uterine fibrosis.

When a childless woman who had been married for some years gave a history of regular menstruation without undue loss or unusual pain, and, on examination, the pelvic organs appeared to be normal, the case might be regarded as one of functional sterility. There were then several possibilities to be considered. Complete intercourse might not have taken place; or the husband might be at fault, suffering from azoöspermia or from a deficient vitality of the spermatozoa; or, thirdly, it might be an instance of "sexual incompatibility." Of the conditions that caused or favoured sterility but allowed of treatment, some prevented normal intercourse—such as atresia of the vaginal orifice, stenosis of the vagina and rigidity of the hymen, dyspareunia and vaginismus, and tumours encroaching on the vagina—all of these were more or less amenable to surgical treatment. Inasmuch as prolapse and procidentia were usually the sequel of child-bearing, they were the cause of secondary rather than of primary sterility. The obstacle to intercourse was mechanical, and treatment gave a good prognosis. Conditions that allowed intercourse but interfered with ascent of the spermatozoa included under-development of the uterus; in this the prognosis depended mainly on the patient's age; if she was not much over 20, it might be an instance of delayed rather than of arrested development. The presence of either anteflexion of the uterus or stenosis of the os externum must be regarded as very unfavourable to conception; but it could not be said that conception was impossible, and, from the point of view of prognosis following treatment, these were among the most satisfactory cases. Retroversion of the uterus, again, must be considered as unfavourable to conception, but not as definitely preventing it. In atresia of the os externum prognosis was hopeless without treatment, and not very good with it; but, nevertheless, an attempt should be made to restore the patency of the canal. Under the heading of polypus in the uterine canal might be included fibroid and mucous polypi and submucous fibroid, and in nearly every case the condition could be cured by operation. Endometritis sometimes caused absolute sterility by preventing conception, probably through the injurious effect of the discharge on the virility of the spermatozoa.

It was nearly certain that in cases of mild salpingitis without occlusion of the tubal ostia, conception could take place, and in all probability the sequel was often a tubal pregnancy. It might be supposed, however, that uterine pregnancy also followed, for cases were familiar in which child-bed fever was apparently due to the lighting up of a latent infection of the tubes. Obviously when salpingitis with occlusion was present conception was impossible; but within certain limits it could be remedied by operation—namely, in those cases in which there had not been extensive suppuration or damage to the tubes. An artificial ostium could be contrived by making an incision in the tube, near the ovary, and oversewing the edges, to prevent the opening from closing up again.

Dr. R. A. GIBBONS said that the average fertility of fertile marriages during the whole of the child-bearing period was ten. As the result of a voluntary confidential census among intellectuals, it was found that of 120 marriages, 107 were "limited," and that the average number of children of each marriage was considerably under two. Congenital sterility was rare, both in men and women; but the number of children in each family had steadily declined in recent years. He had known women who had started married life with a determination to avoid conception, and later had done all they could to cause conception and had failed. There were others who, having had one child, had resolved to have no more; and when, later on, they changed their minds, they were bitterly disappointed that all their efforts to procure a second child had had no result. The majority of men did not know the harm which might follow the use of preventives, especially to the nervous system of women with normal sexual feelings.

Mr. KENNETH WALKER had examined a number of husbands of women patients of Dr. Donaldson. In about 15 per cent. of the cases it could be stated that the husband was sterile, and in a still larger number something abnormal could be detected in the genitalia; there was either oligospermia or what might be regarded as an undue number of degenerate forms of spermatozoa, or signs of inflammatory trouble in the testes, prostate, or vesicles. If the vesicles of a rat were removed he remained fertile; the same was true after excision of the prostate. But if he were deprived of both prostate and vesicles he was sterile. Mr. Walker believed this to be confirmed by clinical experience, and it showed that the mere presence of spermatozoa in the semen did not prove that the male was beyond suspicion.

Dr. HERBERT SPENCER had given up dilating the uterus for sterility for nearly twenty years in favour of Pozzi's operation, and he had seen one case in which an underdeveloped uterus, which had been dilated unsuccessfully, had conceived at once, after seven years' sterile life, after performance of Pozzi's operation. He corroborated Dr. Gibbons's remarks on the frequent use of preventives and

their effect in causing permanent sterility. This was especially the case with quinine pessaries.

Dr. LOUISE MCILROY said that the work of the future must go upon physiological and biological lines, and the effect of the internal secretory organs upon the reproductive functions must be studied further. The ovum should be looked upon as a temporary ductless gland; and in cases of repeated abortion for which no cause could be found there was sometimes evidence of the inhibitory action of the endocrines upon the growth of the ovum. Among cattle it was found that the massage of an ovary containing a persistent corpus luteum favoured fertilization in previously sterile animals. Dr. McIlroy was of the opinion that the Section should utter a protest against the growing use of contraceptive pessaries. Efforts to prevent the satisfaction of the maternal instinct when the sex instinct was stimulated at the same time were no doubt accountable for many gynaecological conditions and neuroses.

Dr. FAIRBAIRN felt that the cases that caused most difficulty were those without physical signs or mechanical causes; and he agreed with Professor Louise McIlroy that more biochemical research into the causes of sterility was needed.

Reviews.

CLINICAL DISORDERS OF THE HEART BEAT.

THAT within nine years, more than half of these disturbed by the war, no fewer than five editions of Dr. THOMAS LEWIS'S *Clinical Disorders of the Heart Beat*[1] have appeared bears eloquent testimony to the profession's opinion of the value of this clear statement of a difficult subject. It is surrounded, for the ordinary man, by a certain amount, if not of mystery, at least of the unknown in connexion with the electro-cardiograph and the polygraph, with which, as the means of investigation, he is familiar in name but not in deed. Dr. Lewis has given in full detail the evidence on which the modern conception of cardiac disorders and disease is based in many papers and other books, especially *The Mechanism and Graphic Registration of the Heart Beat* (reviewed in the BRITISH MEDICAL JOURNAL of July 31st, 1920, p. 166). Here, in a convenient form, he lucidly sets forth the practical conclusions required by the practitioner for his daily work.

In reply to the question, In what degree is an acquaintance with the graphic method essential or expedient in the routine of practice? Dr. Lewis answers that, though the acquisition of the necessary manipulative skill and experience demanded by the taking and interpretation of such records will often entail too much expenditure of time and energy to repay the practitioner or his patient, the practitioner should be thoroughly conversant with the new knowledge thus put within his reach. With this information in mind there are few important disorders of the heart which the unaided and practised senses cannot recognize. This handbook supplies this information by giving an account of the clinical picture, prognosis, and treatment of the seven forms of cardiac disorder—namely, sinus arrhythmia, heart-block, premature contractions or extra-systoles, simple paroxysmal tachycardia, auricular flutter, auricular fibrillation, and alternation of the heart—so clearly and authoritatively that every practitioner and student should have it in his possession and its teachings in his mind.

THE ENDOCRINE ORGANS IN GYNAECOLOGY.

The Endocrines,[2] by Professor BANDLER, is one of those books whose conversational if attractive title is a little misleading, for the work is not a comprehensive study of the subject so much as a somewhat limited consideration of the ductless glands from the point of view mainly of the gynaecologist. Written with the author's customary fluency, it is pleasant reading, and its perusal will undoubtedly repay those who foresee in the subject a vast field for much work, and, it is to be hoped, successful and beneficent employment in the near future of gynaecology. The structure of the book suggests that it has been composed in part by the conglomeration of several separate papers. This may, perhaps, be the explanation of an unnecessary discursiveness on subjects which are not always obviously germane to the main thesis.

Professor Bandler begins by a long discussion of heredity and environment, written in a most grandfatherly style, in the course of which he makes many interesting observations on the emotions and characters of childhood, adolescence and maturity, and gives much prudent advice on education and upbringing. In a subsequent chapter he is led to emphasize the study of the inheritance of tendencies to aberration in the interrelationship of the ductless glands; the recognition of such tendencies will, it is thought, provide the physician with a fund of foreknowledge that may well prove a powerful and effective instrument in his dealings with his patients. A brief systematic study of the different individual glands and their functions prefaces a chapter on the particular bearings of the different hormones on gynaecological conditions, especially upon puberty, the menopause, and menstrual disorders. The possible influence of the internal secretions on the causes of sterility forms a peculiarly interesting chapter. Then follow sections indicating the part played by the secretions of the endocrine glands in connexion with the emotions and instincts, phobias, and mental and nervous defects and deficiencies. Lastly, there is a chapter on the all essential balance of the different secretions. The later part of the book deals with endocrine therapy, with methods of investigations into endocrine defects, and with the author's own case records.

Altogether Professor Bandler has produced a most interesting volume, and while it may be felt that several of the views he strenuously upholds still await confirmation, not to mention proof, it may well be that for this very reason his book will be found the more stimulating to thought, and probably also to methods of treatment, some of which are still in large measure empirical. It is impossible to read such a book as this without feeling that, while we are certainly on the verge of great discoveries, we are just as likely to be entering on a period when potent hormones will be widely employed as drugs with the same lack of discrimination as characterizes vaccine therapy in many hands—guided, it may be, more often by the seductive advertisements of the manufacturing chemist than by knowledge. But the discovery of the truth is never to be hustled. There are to be found in Professor Bandler's pages warnings against a merely ignorant optimism, but let not his readers be carried away too completely by the infection of his enthusiasm when, for example, he breaks out into prophecy. "In five years there will be few mental defectives (new), few insane (new), few tumours (new), few cancers (new), few diabetes (new). Since they are due to endocrine aberrations they will be corrected in their earliest stages by endocrines. When the next war comes soldiers going over the top will not be given alcohol; they will be given endocrine cocktails, and adrenal cortex will be an important ingredient." His experience as an obstetrician should have made the author particularly chary of committing himself to prophecy. But perhaps this is a mental by-product of a "dry" America!

THE TREATMENT OF THE NEUROSES.

DR. ERNEST JONES devotes the major portion of his book on the *Treatment of the Neuroses*[3] to an account of hysteria and a critical survey of the various physiological and psychological measures which have been suggested for its treatment. The views developed in this chapter are largely applicable to the psychoneuroses generally, and are here grouped under the one heading of hysteria in order to avoid needless repetitions in dealing with other forms of disorder. The author gives an excellent description of the hysterical personality, and in providing a lengthy summary of the various therapeutic methods of approach he clearly indicates their value and limitations, and has many pertinent criticisms to offer. As an exponent

[1] *Clinical Disorders of the Heart Beat.* A Handbook for Practitioners and Students. By Thomas Lewis, C.B.E., M.D., D.Sc., F.R.S., F.R.C.P. Fifth edition. London: Shaw and Sons. 1920. (Cr. 8vo, pp. 140; 54 figures. 8s. 6d. net.)

[2] *The Endocrines.* By Samuel Wyllis Bandler, M.D., Professor of Gynecology, Post-Graduate Medical School, New York. Philadelphia and London: W. B. Saunders Company. 1920. (Med. 8vo, pp. 494. 35s. net.)

[3] *Treatment of the Neuroses.* By Ernest Jones, M.D.Lond., M.R.C.P. Lond. London: Baillière, Tindall, and Cox. 1920. (Demy 8vo., pp. viii+253. 10s. 6d. net.)

of Freudian views in this country, Dr. Jones devotes particular attention to psycho-analysis as a form of treatment, and here becomes a strong partizan rather than a critic.

It is difficult to avoid the reflection that if the author had shown the same critical attitude towards the system he so strenuously supports as he does towards alternative methods of treatment his book would have been a contribution to medicine of considerably greater value. He is much less convincing as an advocate than as a critic, and his attitude towards his own subject is dogmatic rather than persuasive. Especially is it to be regretted that the author still finds it necessary to deny the possibility of an objective standpoint on the part of the opponents of his doctrines, and that, in advocating his views, he is unable to avoid a discussion of the mental state of those who find themselves unable to agree with him. Can it be that the select coterie of Freudian adherents are the sole exponents of a scientific attitude towards the problems of mental life? The method upon which Dr. Jones bases his views would seem to involve the interpretation of phenomena on the basis of a system of beliefs already held by the observer to an extent which would not be considered permissible in any other branch of science, for he writes as follows:

"As was indicated above, the material gained in these various ways is then submitted to a process of elaboration and elucidation, whereby the same characteristics in different parts are brought together, correlations established, obscurities clarified, and underlying connexions and meanings made plain. The resulting interpretations are made use of to *direct the patient's attention* towards the more hidden material for which they furnish clues. The technique of psycho-analysis comprises innumerable minor rules dealing with the interpreting of material, and with the difficult question of how to decide the right moment for *conveying the interpretations to the patient.*" (Page 136; italics ours.)

Surely the scientific validity of this method is at least open to question, and Dr. Jones should not be surprised if many psychologists hesitate to accept a view of mental life and development based upon a mode of investigation in which suggestion is admitted, and can, indeed, scarcely be avoided.

A STANDARDIZED BINET-SIMON SCALE.

THE growth of the use of mental tests on the Binet-Simon lines both in schools and in courts of justice, has suggested the desirability of standardizing these tests so that the results obtained in the investigation of mentality may be to some extent interchangeable and of value in communication between those interested in a given case. Hitherto no manual has appeared which embodied a uniform method of dealing with such questions as the following: With what tests should the examiner begin? Which of two alternative questions should first be employed in a given case? Under what conditions may a test be repeated? A few years ago a series of experimental investigations in the testing of mentality were instituted by Mr. NORBERT J. MELVILLE of Philadelphia. The results of this research are embodied in a book entitled *Standard Method of Testing Juvenile Mentality by the Binet-Simon Scale and the Porteus Scale.*[4] The conduct of the investigation necessitated the training and supervision of several hundred co-workers and the valuation of the results of some thousand Binet tests. The work was done in a number of public schools in New York, Princeton, and Philadelphia. The results of Binet tests, it is pointed out, do not always tally with the known state of scholarship. The Binet scale was expressly designed so that it should not be a direct test of school knowledge but of juvenile mental development. The scale determines how much an individual has profited from some typical forms of experience and training which the majority of children in civilized countries undergo, not only in school but also in the home and in the playground. The book is divided into two parts. The first deals with the nature and scope of the tests, their manner and order of usage, and the materials to be employed. The second gives a series of standardized tests for each age. The tests are actually given in the pages of the book in questions, drawings, and coloured diagrams. These pages are undercut so that reference is facilitated.

In the introduction, written by Dr. William Healy, there is a necessary warning that people of sound training and good judgement are needed to use these methods for the better study of human beings.

A MEDICAL TEXTBOOK FOR NURSES.

NURSES are charged with the responsibility of carrying out the orders of the medical man, and it is claimed by Dr. FORTESCUE-BRICKDALE in his *Textbook of Pharmacology and Medical Treatment for Nurses*,[5] that this function will be performed with more accuracy and intelligence the more nurses appreciate the ideas which underlie their instructions. With this principle we agree.

The book is divided into two parts. Part I deals with pharmacology, and in very simple and concise language gives an account of the action of the ordinary medicinal remedies. Technical terms are for the most part avoided, and no doses are given. It is a good feature of the book that in the discussion of any drug or group of drugs the various proprietary remedies which have come into use, and which are copies or slight modifications of well-known drugs, are described. This is of some importance, as in these days the nurse as well as the medical man is circularized by the vendors of proprietary remedies, and her education affords her no means of forming an opinion. It might have been well had the writer taken the opportunity of impressing on his readers the fact that proprietary remedies, with few exceptions, are either drugs in the experimental stage or mere commercial speculations, and to point out that when a drug is proved to be of value it is included in the *British Pharmacopoeia*.

The book is well illustrated by anatomical diagrams, for example, of the heart when digitalis is discussed; by pictures of plants, sometimes coloured, and by tracings which show the action of drugs clearly, and are easily understood. This part also contains an account of vaccine and serum treatment, and of organo-therapy. The author has explained in simple language the foundation of medical treatment, and we have few criticisms to offer. Perhaps he deals with ions more fully than is necessary, and opsonins, even if they exist, are of no importance to nurses.

Part II deals with treatment, but wisely contains no clinical or pathological details. A nurse ought to know the nature of the disease from which her patient is suffering, and be familiar with the routine methods of treatment, and the object of the present part is to explain the rationale of this treatment. The diseases are arranged according to organs, such as diseases of the urinary organs, respiratory system, fevers, and so on, and special stress is laid on that portion of the treatment which the nurse is expected to carry out. The illustrations in this part also are good and helpful. It is a pity that more is not said on methods of administering remedies, the masking of tastes, preparing and administering hypodermic injections and details of disinfection, and less on the medicinal treatment of symptoms such as, for example, those that may occur in locomotor ataxy. It is doubtful whether anyone without a knowledge of physics could understand Appendix III, which gives the scientific basis of radio-therapy. The book is admirably printed in large type, and is very free from errors. It is the first book of its kind, and we can whole-heartedly recommend it to every one who is taking up nursing as a profession.

A SYNOPSIS OF PHYSIOLOGY.

Physiology,[6] by Dr. FFRANGCON ROBERTS, in the Students' Synopsis Series, is a small book "definitely addressed to those who are already acquainted with the elements of the subject, and is intended to supplement the larger textbooks." It is not a mere cram book or a boiled down edition of the larger textbooks, it is a synopsis in which the salient features of the subject are well brought out, and, in the case of the chapter on intermediate metabolism,

[4] *Standard Method of Testing Juvenile Mentality by the Binet-Simon Scale and the Porteus Scale of Performance Tests.* By Norbert J. Melville, Philadelphia; with an Introduction by William Healy, M.D., Director of Juvenile Psychopathic Institute, Chicago. Second enlarged edition. Philadelphia and London: J. B. Lippincott Co. 1921. (Cr. 8vo, pp. 162; illustrated. 12s. 6d. net.)

[5] *A Textbook of Pharmacology and Medical Treatment for Nurses.* By J. M. Fortescue-Brickdale. London: Henry Frowde, and Hodder and Stoughton. 1920. (Double Roy. 8vo, pp. 405; 77 figures, 5 plates. 25s. net.)

[6] *Physiology.* By Ffrangcon Roberts. Students' Synopsis Series. London: J. and A. Churchill. 1920. (Cr. 8vo, pp. 397; 73 figures. 15s. net.)

very well presented. The arrangement is good and logical, and only a few actual errors have been detected. The illustrations on the whole have been well selected, and do illustrate the points intended.

A GUIDE TO NEUROLOGICAL DIAGNOSIS.

THE guide to neurological diagnosis,[7] written by Dr. K. SINGER, and published in Berlin, is arranged on clinical lines, being divided into chapters on paralysis of peripheral and central origin, disturbances of sensation, conditions of increased and diminished reflex activity, fits, and so on. A certain amount of anatomy and physiology and a modicum of pathology are introduced. A serious drawback is the absence of any really good illustrations or figures in the text. Such figures as do occur cannot be praised, and in this respect the book compares unfavourably with similar British or American publications. We have noticed strange omissions. Thus, in the section devoted to paralysis from spinal cord lesions we find no reference to the experiences of the neurological injuries of war and particularly to the work of Head and Riddoch in this respect. The account given of disturbances of sensation arising from cerebral lesions, again, is altogether inadequate. In a very brief paragraph on the etiology of multiple neuritis no mention is made of acute toxic polyneuritis. The chapter on disturbances of speech follows quite conventional lines, is very short, and hardly adequate for so large a subject.

Diseases of the sympathetic nervous system receive very scant consideration, particularly in view of the large amount of interest the subject has recently aroused. For a book bearing the date 1921 it does not fulfil expectations.

THE CONTRIBUTION OF MEDICINE TO HISTORY.

THE influence of variations in the health of kings and ministers and other persons of political importance on the course of events is a department of history which has attracted more attention in France than other countries, probably because for some three centuries that country was an effective autocracy where the state of mind of the ruler—a fit of depression or a spasm of exaltation—might have immediate and serious effects on policy. Interest in the subject and his belief in the influence of breeding and heredity combined to disturb the judgement of Michelet, and sometimes perhaps biassed even Taine. It has been a favourite side study with many members of the medical profession in France, and it has been for thirty years the main occupation of Dr. Cabanès of Paris; he is the author of a whole shelf full of very readable books, and the editor of a monthly periodical, the *Chronique Médicale*, which gives hospitality to a multitude of scraps of curious information, mainly biographical, and contains during a year a number of longer articles often of considerable historic interest and importance.

During the winter before last Dr. CABANÈS gave a course of lectures in Brussels; these he has revised, and they are now published in a volume entitled *L'Histoire éclairée par la Clinique*.[8] Some parts of the volume are more solid fare than the author is accustomed to offer his readers. The earlier chapters are concerned with the importance of science in general to the study of history, and the real subject of the book is only reached when he comes to discuss the help medicine can give to the historian by enabling him in the first place to recognize the mental or bodily disorders, permanent or transitory, of political personages, and, in the second, to appraise correctly the effect of such disturbances on public affairs. Dr. Cabanès gives some examples of the way in which a minute study of details may sometimes suggest probable explanations of peculiarities of conduct that have puzzled contemporaries and historians alike. To one of these we make reference elsewhere. Dr. Cabanès is a judicious guide; he is an enthusiast for his subject, but anxious to make a just estimate of its importance. His final chapter, in which he sums up the lessons he has learnt during the many years he has given to the study of the relation of medicine to history, should be read by professed historians as well as by medical men who take an interest in the philosophy of history or even in its biographical and anecdotal byways.

[7] *Leitfaden der Neurologischen Diagnostik.* By Dr. Kurt Singer. Berlin and Vienna: Urban and Schwarzenberg. 1921. (Sup. roy. 8vo, pp. 216; 33 figures. M.45.)

[8] *L'Histoire éclairée par la Clinique.* By Dr. Cabanès. Paris: A. Michel. 1921. (Demy 8vo, pp. 320.)

NOTES ON BOOKS.

TUBERCULOUS salpingitis forms the subject of the most recent fascicule of the *Johns Hopkins Hospital Reports*.[9] The writer, Dr. J. H. GREENBERG, has made a painstaking study of the 200 cases in the hospital gynaecological records; the conclusions he has been thus enabled to reach are instructive and of particular value on account of the large amount of material on which they are based. The general incidence of the condition amongst 24,000 gynaecological patients was found to be just under 1 per cent.; amongst all forms of salpingitis it accounted for 7.5 per cent. Tubercle bacilli were found in 20 out of 25 cases specially stained for the purpose. Tuberculosis of the uterus was proved to coexist in 45 per cent., but its true coincidence is suggested as being more probably about 72 per cent. Cervical tuberculosis was present in only 3.5 per cent., and vaginal tuberculosis in 0.5 per cent.; peritoneal involvement existed in 63 per cent., and the appendix was found to be tuberculous in 3 per cent. Four cases (2 per cent.) had associated tuberculosis of the urinary tract. The mortality in hospital was 8.5 per cent., and of those operated upon 7.6 per cent. A full bibliography is given. Dr. Greenberg is to be congratulated on a good piece of work, which will be of value for purposes of reference.

In his volume, *De l'Anaphylaxie à l'Immunité*,[10] Professor MAURICE ARTHUS of Lausanne, whose name is so familiar in connexion with Arthus's phenomenon or local gangrene at the site of repeated injections of horse serum into a rabbit, has collected together the results of more than fifty of his papers published on this subject since 1903 and based on 2,500 experiments. This record of devotion to a difficult subject contains in a convenient form Professor Arthus's numerous observations on anaphylaxis, protein poisons, snake poisons, antivenomous serum, and anaphylaxis-immunity. It is a statement of indefatigable experimental research, and acting up to his motto, "beware of theorists and of theories," he refrains from embarking on hypotheses. He finds that in the dog anaphylaxis, both active and passive, is specific, whereas the rabbit is an exceptional animal in that anaphylaxis is not specific. His experiments convince him that the cells of the central nervous system are not directly acted upon by toxic proteins or in anaphylaxis, thus differing from the general opinion as to the production of anaphylactic shock. On the question whether anaphylaxis and immunity are modifications of the same condition or are independent states, he concludes that they are distinct.

The two periodicals *Psychobiology* and the *Journal of Animal Behaviour* have been merged under the new name of *The Journal of Comparative Psychology*.[11] The journal will be edited by KNIGHT DUNLAP, Johns Hopkins University, and ROBERT M. YERKES, National Research Council, in association with a number of prominent American psychologists. It will be issued bi-monthly, and the *Behaviour Monographs*, which are issued irregularly, will be continued in connexion with the new journal. Studies which contribute to the knowledge of mental function and behaviour of any organism will be accepted for publication. The new periodical is expressive of the increasing tendency of psychology to develop into an objective science, and it will no doubt furnish contributions of much value to the understanding of animal and human behaviour. The first number (February, 1921) consists of two interesting contributions. John Linch Ulrich writes a second instalment of his researches on the "Integration of movements in learning in the albino rat," and English Bagby writes on "The psychological effects of oxygen deprivation."

The number of books intended to give the young mother information needed for the preservation of her own health and that of her infant is now very large. Among the best is *Mother and Child*,[12] by Dr. EDWARD P. DAVIS, of Philadelphia. In revising the text for the fourth edition he has taken the opportunity of warning older women against some common fallacies. There are many illustrations, most of them helpful, though the picture of a bassinette looks as though it came from a tradesman's catalogue, and some others might have been omitted without really detracting from the value of the book.

[9] Volume xxi, Fasciculus II. Baltimore. 1921. (Pp. 97-156; 2 plates.)

[10] *De l'Anaphylaxie à l'Immunité.* Par Maurice Arthus, Professeur de Physiologie à l'Université de Lausanne. Paris: Masson et Cie. 1921. (Pp. xxxvi+363. Fr. 20.)

[11] *The Journal of Comparative Psychology.* Edited by Knight Dunlap and Robert M. Yerkes. Baltimore: Williams and Wilkins Co. Vol. i, No. 1, February, 1921. Price per volume, 5.50 dols.

[12] *Mother and Child.* By Edward P. Davis, A.M., M.D. Fourth edition, revised. London: J. B. Lippincott Company. 1921. (Crown 8vo, pp. 294. 12s. 6d. net.)

THE FEDERATION OF MEDICAL AND ALLIED SOCIETIES.

ANNUAL DINNER.

THE annual dinner of the Federation of Medical and Allied Societies took place at the Café Royal on May 26th. Sir BERKELEY MOYNIHAN, the President of the Federation, was in the chair, and among those present were Dr. Addison, M.P., Sir Alfred Mond, M.P., Lord Dawson of Penn, Lord Queenborough, Viscount Knutsford, Sir George Newman, Sir H. Kingsley Wood, M.P., Dr. Nathan Raw, M.P., Dr. Donald Murray, M.P., Sir Philip Magnus, M.P., and Dr. F. E. Fremantle, M.P. The company numbered just over a hundred, and included representatives of thirty-eight separate societies of the medical and allied professions.

Sir BERKELEY MOYNIHAN, in proposing the health of Dr. Addison, said that the late Minister of Health had been subjected to a considerable amount of criticism, but that was an atmosphere in which politicians thrived. Some of the criticism had been timely, wise, and helpful; some of it had been silly, displaying poverty of imagination and even of invective; and some of it had been malignant, though in the part of the country from which he came he had never discovered any metastatic deposits from that malignant focus. He knew Dr. Addison many years ago when the future statesman was an anatomist. He bitterly regretted that Dr. Addison had deviated—he would not express it in terms of pathological degeneration—towards politics. Had he remained an anatomist he would now have been the first anatomist in the Empire. He wrote a work on the topographical anatomy of the abdominal viscera, especially the gastro-intestinal canal. "I have perhaps as friendly and intimate acquaintance as anybody," said the speaker amid laughter, "with most of the abdominal viscera, and I can assure Dr. Addison that the viscera appreciate very much the work he has done on their behalf. Those who have to teach the topographical anatomy of the abdominal viscera to students to-day have to refer to the work of Addison. So far at least as anatomy is concerned, Dr. Addison's name is immortal." Dr. Addison's appointment as first Minister of Health (he continued) was received with acclamation by the whole profession. It needed courage to accept the office. It was not incongruous to suggest at that table that there were some present who might well have been thought of in connexion with the post, but he would like to ask them and to ask himself—for the "Gentleman with the Duster" had put him in the ideal Cabinet as Minister of Health—if any one of them could have done so much and so well in so short a time. There could be no discordant voice in the profession as to Dr. Addison's aims, even though there might be difference as to his procedures. He had had not only to overcome ignorance, but to fight against the stultifying imperviousness to new ideas. And he had done things which no man would ever be able to change. It had to be remembered, of course, that his plans were conceived in a time of national prodigality, and had to be put into practice in a time of national poverty. But he (Sir Berkeley) would plead with those whose voice had any weight with the people in authority that the last direction in which economies were insisted on should be the broad highway which led to national health. The whole profession owed a great debt to Dr. Addison, who would be astonished if he knew what backing he had from general practitioners. The Federation also owed him a debt because, at the very beginning of its history, he, standing high in the councils of the nation, had pleaded for a united profession. Theirs was a profession of divided counsels and jarring factions; its interests were not necessarily conflicting, but pains seemed to be taken very often to make them so. The speaker concluded with a happy allusion to the rod of Aesculapius, likening Dr. Addison to the god Mercury, who threw his staff among the quarrelling serpents, so that they twined themselves around it henceforth in friendly co-operation.

Dr. ADDISON, in reply, expressed his thanks for the cordiality with which he had been received, and praised the aim of the Federation to bring together the medical and allied professions, and to foster among them a lively interest in public questions. To those who had eyes to see it was clear that, whatever might be the ebb and flow of events, society would seek more and more to enlist the aid of those who could best help it to promote the physical well-being of its members and to prevent avoidable disabilities. The mass of avoidable disability was strikingly revealed during the war, and it was because of this that the dominant purpose of the Ministry of Health, at least in the early stages of its history, must be to develop and encourage all preventive agencies. In order to do this a long view was necessary. Opportunist spectacular performances were not the function of such a Ministry. He might give many illustrations on this point. The Ministry, for instance, had inaugurated a system whereby assistance was rendered to port sanitary authorities in order to prevent the invasion of post-war pestilence. The total cost of this scheme was £65,000 in this year's estimates. Owing to the vigilance and efficiency of the sanitary authorities the country had been kept free from any such epidemic. This trifling insurance had enabled us to escape a disaster which would have been hundreds of times more costly than the insurance itself. But such a piece of prevention did not lend itself to headlines, and the kind of critic who went in for terminological fireworks could see no definite return for the money spent. The same was true of the expenditure on maternity and child welfare. The extra grants, entailing the expenditure of a few thousands, which had been made with a view to increasing the efficiency of nurses, health visitors, and others, by means of special training classes, had contributed to no small extent to the striking improvement in infant welfare statistics. A recent vote in Parliament to cover a week's loss owing to the railway strike equalled the total expenditure by the Exchequer on the whole of the maternity and child welfare services in England and Wales for seven years. He was interested to see that one of the most flamboyant critics of his health expenditures had not hesitated to press for one more super-dreadnought over and above the Admiralty requirements, and that leviathan, if it were voted, would bury an amount equal to six or seven years' expenditure by the Exchequer on maternity and child welfare. Frankly, he himself would place the interests of British babies before the building of barracks in Baghdad. In conclusion Dr. Addison referred to his housing scheme, two features of which, he said, would gradually come to be realized: first, the condition that no local authority or private builder could build more than a certain number of houses to the acre; secondly, the condition, coming into force in 1923, whereby all the major authorities of the country would be required to provide a town-planning scheme to govern the future development of their districts. This would lead to the gradual elimination of the biggest blot on our industrial system—namely, the inconsiderate crowding together of masses of the population, without regard to the needs of the people or the claims of the future.

Sir MALCOLM MORRIS, Vice-President of the Federation, was in charge of the toast of the Minister of Health. In proposing it he briefly reviewed the history of the Federation, which began, he said, in an effort to increase the number of medical men in Parliament. The medical men in the House of Commons numbered twelve at the present time. It was desirable that they should have fresh accessions. He hoped particularly that a woman doctor would find her way into Parliament to accompany the solitary lady who at present sat on the green benches. He hoped also that Lady Rhondda, whose interest in health questions was so acute, would secure admission to the House of Lords. The Federation had gone on to a wider effort to bring together the various organizations entitled to speak for the medical and allied professions. The central council of the Federation did not initiate schemes and then appeal to the constituent bodies. The Federation had no central policy, beyond that of providing a round table for conference. Its object was simply to secure the greatest common measure of effective opinion. It was faced with one great difficulty—the aloofness of the British Medical Association. As one of the officers of the Federation he would like again to offer to the British Medical Association the right hand of friendship. The Federation was not in antagonism to the Association; it did not want to interfere with the Association's autonomy, and it appreciated enormously the good work which the Association had done in the past. But on these health questions they ought to speak as one body, including all who were immediately concerned in national health.

Sir ALFRED MOND, in his response, agreed with the sentiment of the proposer that it was desirable that the medical profession should speak with unanimity and decision on questions of public health. When experts differed it was easy for the scoffer to refuse to listen to either party, and correspondingly hard for those who were responsible for administration. Proceeding, he said that he had himself fallen on evil days: not only did a layman succeed a medical man, but his predecessor began his work at a time when it was assumed that the purse of the nation was bottomless, whereas he took office when the nation was buttoning up its pocket. A Minister had to keep in his hands the clinical thermometer of the House of Commons and to watch the temperature chart of public

opinion. It was not for him to have recourse often to violent drugs which killed or cured, but rather to seek the aid of safer old-fashioned remedies which might produce some amelioration of the patient's condition. While it was difficult to advocate a launching out in many directions he deprecated any forfeiture of what had been gained of recent years. At the present time he was waiting for the report of Lord Cave's committee, and was doing all he could to expedite it. No one could contemplate without dismay the closing down of beds in hospitals. It was inconceivable that these great institutions should be allowed to curtail their operations; it could only be a question of ways and means of re-establishing them. He agreed with Dr. Addison that preventive medicine was not spectacular; indeed, if he wanted to achieve undying fame he would allow some great epidemic to break out, and then show with what energy his department could combat it. Medical research had to go hand in hand with preventive medicine. Without knowledge it was difficult to prevent, and even more difficult to cure. He hoped that some lessons would be learned from war strategy, and that disease would be attacked more and more in mass formation and not by solitary sniping. With the development of science he looked to the time when there would be no disease at all, in which case both the Ministry of Health and the medical profession would become extinct, unless, indeed, the community followed the example of the Chinese and remunerated doctors according to the number of days in the year that they were well. He paid a tribute to the value of medical men in the House of Commons, and added that he would always receive with gratitude any suggestions that the Federation might make to him.

Dr. FREMANTLE, M.P., in proposing the toast of the Federation, described himself as its parliamentary baby, for he owed much to its help in winning his by-election. Like Sir Malcolm Morris, he desired to hold out the hand of fellowship to the British Medical Association—an Association with so distinguished a record behind it. It was only as a loyal member of the Association that he proposed the toast. The organization of the Association was the most complete and logical scheme that could be based on a democratic principle. Any member of the profession who joined the Association found himself immediately related to its affairs, alike through its weekly JOURNAL, edited with such extraordinary ability, and through its local organization. But the Association had only managed to enrol two-thirds of the profession. He thought that a more fluid method of collecting and expressing opinion was called for, excellent as the Association's method was from the purely democratic point of view. Even among the Association's membership there were many who took no interest whatever in the procedure which was supposed to bring about their representation in the Representative Body and the Council. He did not despair of the democratic method, but some more adaptable arrangement seemed to be also required, and, moreover, the opinion of allied professional bodies should be elicited.

Dr. ARTHUR LATHAM, in responding to the toast, said that while certain individuals were resentful of new ideas, he did not believe that the British Medical Association in its constituencies was really hostile.

ANAPHYLAXIS AND IMMUNITY.

LECTURE AT THE ST. MARY'S HOSPITAL INSTITUTE.

THE lecture contributed by Dr. H. H. DALE, F.R.S., to the series on pathological research in its relation to medicine, which is being given at the Institute of Pathology and Research, St. Mary's Hospital, London, was on anaphylaxis and immunity.

He began by pointing out that anaphylaxis was not the opposite of immunity. It did not represent, as Richet at first thought it did, an increase of sensitiveness to a naturally poisonous substance. Anaphylaxis was a condition in which an animal responded by just the same type of reaction to normally harmless substances to which it had been rendered specifically sensitive as to poisonous ones. It might be defined as a condition of abnormal sensitiveness to a foreign protein, so that, whatever the nature of the action of the protein in question, whether ordinarily poisonous or not, the animal reacted to it as though it were an acute poison of a particular type. It was important to bear in mind that the characteristic of anaphylaxis was not the appearance of symptoms but the mode of their production. In the mode of its production and in its specificity anaphylaxis resembled immunity, though its effects seemed to be so strikingly different. The resemblance was strengthened when it was remembered that the condition of anaphylaxis, like that of immunity, could be transferred from one animal to another. Passive anaphylaxis, caused by the transfer of serum from the anaphylactic animal to the normal animal, did not operate immediately; an interval of from twelve to twenty-four hours after injection was necessary, even when the injection was intravenous, before the transfer of passive sensitiveness could be detected.

Practically all workers, with the conspicuous exception of M. Besredka of the Pasteur Institute, were unanimous in their opinion as to the nature of the anaphylactic antibody. It was generally recognized that the anaphylactic antibody was not a peculiar new kind of body, but one which had been long familiar to immunologists as precipitin. The evidence for this was not complete, but was complete enough to make any other assumption unnecessary. The limits of the specificity of the anaphylactic reaction were very closely similar to those of the precipitin reaction. The serum from the anaphylactic guinea-pig would convey the sensitiveness to a normal guinea-pig. The anaphylaxis so conveyed was not of a high degree, and a large quantity of serum from the anaphylactic animal was needed to transfer it. Much more efficient in transferring passive anaphylaxis was the serum from a rabbit which had had a series of injections of the antigen. The rabbit precipitin, injected into the guinea-pig, rendered the guinea-pig exquisitely sensitive to the antigen. If the anaphylactic antibody was not identical with precipitin, at any rate it was closely parallel in its formation. One fact, however, seemed almost fatal to this theory. The presence of precipitin could not be discovered in the serum of the anaphylactic guinea-pig; at least, the ordinary coarse precipitin reaction could not be obtained, though the presence of some reaction might be discovered with the ultra-microscope. On the other hand, if the guinea-pig, before it had time to become sensitive, were given not one but a series of injections of the antigen, an obvious precipitin in the guinea-pig serum was ultimately produced, but by this time the animal was not anaphylactic, and would tolerate large doses of antigen without harm.

Up to this point there was substantial agreement among immunologists; but two distinct theories now made their appearance. The first, which Dr. Dale said did not satisfy him, supposed that the reinjection of the antigen into the anaphylactic animal caused the production in the blood of a poison having a certain type of action, and to this hypothetical poison the name of "anaphylatoxin" had been given. Recently there had been a tendency to ascribe its formation to a physical rather than a chemical change. Some vaguely comprehended change in the state of colloidal equilibrium, something similar to the changes which preceded the clotting of the blood, was supposed to give rise to this anaphylatoxin. Dr. Dale, however, was not convinced of the direct connexion of anaphylatoxin formation with the phenomena of anaphylaxis. If a poison of this kind were really formed in the blood, an obvious way of producing the anaphylatoxin *in vitro* would be to mix the blood or serum of the anaphylactic animal with the antigen and inject into a normal animal. That did not work; there had been apparent successes, but in the vast majority of cases such injection was innocuous. More effective still should it be to inject into the blood simultaneously the antibody and the appropriate antigen; but that again did not work. The animal which was given the antibody and the antigen at the same time remained unhurt. Only when the antibody had been in the body for some hours did sensitiveness begin to appear, and not until it had been there for twenty-four hours or more did sensitiveness reach its maximum.

The other theory, and the one which the lecturer commended, offered an explanation for the fact that, after the antibody had been introduced into the normal animal, some hours had to elapse before sensitiveness began to appear. The antibody when circulating in the blood was not sensitizing but protective, and it had to get out of the blood before anaphylaxis could be produced. When once the anaphylaxis was fully developed, the injection of a further large dose of the antibody, instead of increasing the sensitiveness, immediately depressed it, so that the animal again became insensitive. He had repeated that experiment, and it worked. The obvious suggestion was that the antibody, when out of the blood, fixed itself in the body cells, and by its presence there and its reaction with the antigen, brought about something in the nature of precipitation in the sensitive cell protoplasm or

membrane, and that it was this which gave rise to the anaphylactic phenomena. On the other hand, excess of antibody, free in the body fluids, would bring about immunity because it caught the antigen and put it out of action before it reached the cells.

Anaphylaxis, therefore, was not the opposite of immunity, but a particular expression of the immune condition, due to the location of the antibody predominantly in the living cells instead of in the fluids bathing them. This explained why an interval was necessary after the injection of the pre-formed antibody before the animal became passively anaphylactic. It explained why the presence of sufficient antibody to circulate freely in the blood rendered the animal again relatively insensitive. Dr. Dale believed that this anaphylactic reaction represented a very fundamental type of resistance of the body cells to the incorporation into their protoplasm of a protein with a molecular pattern alien from their own. To resist this vitiation of its specific type the cell would die for the individual, or, if the body cells were subjected simultaneously to the attack, the individual would die for the purity of the species. The only chemical difference known between different species was a difference in proteins. The carbohydrates and fats were of a common type over a very wide range of species. It was in the molecular pattern of these complicated proteins, with its tangled skein of amino-acids, that one had a chance of discovering the chemical difference which could be related to a specific or even an individual type.

Dr. Dale touched finally and slightly on the question as it affected practical therapeutics. There were some, he said, who would have them believe that the whole of the phenomena in patients suffering from an acute septicaemia could be explained in the terms of anaphylactic reaction. There was no warrant as yet for making such an assumption. Symptoms of the type seen in the anaphylactic reaction did not necessarily indicate anaphylaxis. There were, however, certain phenomena seen in man which suggested a close connexion with this condition. He instanced the rash and constitutional disturbance following the injection of horse serum, significantly after ten days' interval; also the various idiosyncrasies to foreign proteins seen in hay fever and "horse asthma," which had—to speak guardedly—many points of similarity to the anaphylactic condition.

THE INFLUENCE OF THE DUCTLESS GLANDS IN EVOLUTION.

PROFESSOR L. BOLK of Amsterdam, in a lecture to advanced students of the University of London, delivered on May 12th, dealt with the somatic changes in affections of the endocrine organs and their significance in the evolution of man. He raised many points of extreme interest, and made suggestions which were novel and often daring if not far-fetched, though Professor Gley's speculations (BRITISH MEDICAL JOURNAL, May 8th, 1920, p. 644) may have prepared our readers for them.

Dr. Bolk said that he had always been a strong supporter of the Darwinian hypothesis, and now maintained that the results of his researches were in no way inconsistent with, but rather afforded every confirmation of, the belief that Darwin had provided the correct solution of man's origin. Professor Bolk maintained that the various endocrine glands not only bore a definite and harmonious relation to each other and the organism as a whole, but that they had played a comparable part in the evolution and development of man from his primeval ancestry and origin. They exercised a sort of *imperium in imperio* of a suppressive or retarding character, without which the human race would never have attained its present state of civilization and dominance over the animal kingdom and realm of nature.

In support of the conclusions which he had formed from his research into the problems of endocrinology and evolution, he described certain features peculiar to man as representing the persistence of a primitive condition exhibited during foetal life by primates and higher apes. The hairlessness and absence of pigmentation of the skin in the white races were attributable to the retarding influence of hormones of the suprarenals on the distribution of hair and development of pigment which had taken place in the course of racial evolution. The specimen of a chimpanzee foetus at term, shown by the lecturer, displayed characteristics so far human that pigment and hair were absent from the whole surface of the body save the scalp. It was in consequence of the withdrawal of the suppressive action of the suprarenal secretion after birth that the skin of the ape became hairy and pigmented.

The superiority of the fair-skinned, light-haired and blue-eyed races over the pigmented and negro races might be traced *pari passu* with the extent of the retarding functions exercised by the endocrine glands on racial development. As evidence of the arrest of this function in the suprarenals in man was quoted the well-known pigmentation or bronzing of the skin occurring in Addison's disease.

To the retarding effect of the internal secretion of the thymus gland was attributed the delayed union of the cranial bones and open cranial sutures which had allowed of the growth and development of the human brain to its present eminence. On the other hand, by the removal of the inhibitory action of this particular hormone, there occurred premature closure of the sutures and irregularities in the normal rate of ossification, resulting in various rachitic manifestations.

Further examples of somatic evolutionary changes due to the activity of the endocrine glands and the retarding influence of their hormones were described. The pituitary gland was held responsible for the present conformation of the human skull and increase in capacity of the cranial cavity, the development of the chin, the retraction of the malar prominences, and the smallness of hands and feet which mark the higher races of mankind, in contrast to the small cranium, prognathos and high cheek bones of the apes and lowest human types as seen in the aborigines of the Australian bush. As an instance of disease in man resulting from the arrest of the retarding action of the internal secretion of the pituitary gland, mention was made of the hypertrophic overgrowth of bone and soft structures, so well known in acromegaly.

Attention was directed to the development of the labia majora as a human characteristic attributable to special hormones of the thyroid gland, and stated to be absent in apes and insignificant in female negroes.

In addition to the above-mentioned somatic changes, brought about in the course of evolution of man by the agency of the endocrine organs, these glands have also exercised an influence on the germ-plasm. As instance was given the retarding effect pertaining to the secretion of the pineal body, on the development of the male and female genital structures, which has resulted in an important delay of sexual function, particularly in the higher races of man, to a much later period than is found in the lower mammalia. The abeyance of this factor might, it was suggested, account for the comparatively early sexual development in the lower races of mankind—for example, the negro—and in part explain their racial inferiority.

Professor Bolk also attributed sexual precocity, a condition more often met with in females than males, to the absence of the retarding effect of the special hormone of the pineal body, and as an example quoted a case of pregnancy in a girl aged 7 years. Suggestions of considerable interest were offered as to the gradual influence of change of diet on man's evolution. The increasing amounts of animal food in place of a purely vegetable and fruitarian regimen were regarded as possible potent factors in the high cerebral functions attained by the human race.

The chairman, Professor G. ELLIOT SMITH, in proposing a cordial vote of thanks to the lecturer for his admirable address, commented on the great value of his studies. His own opinion, he said, was that the large size of the human brain could not be explained by assuming that it was due to the perpetuation of the proportion of the large brain to a relatively small body of an earlier stage of development, for it represented an active growth and elaboration, the fundamental factor in the evolution of man. Dr. T. R. Elliott had shown that this marked growth of the cerebrum was associated, in the human full-time foetus, with a striking modification in the structure of the suprarenal glands. He therefore tentatively suggested that this change might disturb the equilibrium of the endocrine glands, and prove the real mechanism whereby the great development of brain was itself responsible for restraining the full emergence of the simian traits of man's ancestor, rather than that this development should be due, as Professor Bolk had attributed, to the influence of change in man's diet.

British Medical Journal.

SATURDAY, JUNE 4TH, 1921.

MEDICINE A SCIENCE.

THE appearance of the second volume of *Studies in the History and Method of Science*,[1] edited by Dr. Charles Singer for the Oxford Press—a periodical or series of volumes which seems likely to become one of the chief mediums for the publication of essays in this department of knowledge—will move some readers to ask for a definition of science. In his preface to this volume Dr. Singer gives none, but in that to the first volume Sir William Osler, though he equally gave no definition, laid it down that the true and lawful goal of the sciences is the acquisition of new powers by new discoveries. It will be noted that Osler used the word in the plural. Sir E. Ray Lankester has recently quoted in more than one place Clifford's definition, if it may be so called, in which it was used in the singular: "The subject of science is the human universe; that is to say, everything that is, or has been, or may be, related to man." This is so wide as not to be very helpful, and, looking round for something more precise, Sir Ray Lankester suggests that the history of the word gives the explanation of its correct use at the present day. He points out that the French Académie des Sciences, founded in the middle of the seventeenth century, recognized various branches of knowledge; in doing so it did not go any further than Roger Bacon, of the thirteenth century, who recognized many sciences, by which term, however, he meant only a department of knowledge. It would seem that, as has happened in the history of many other words, the meaning attached to the term has been gradually and insensibly limited. The *New English Dictionary* recognizes that the word "science" in modern use is often treated as synonymous with natural and physical science, and thus restricted to those branches of study that relate to the phenomena of the material universe and their laws, sometimes with the implied exclusion of pure mathematics. It also recognizes that in a more general but still restricted sense it means a branch of study which is concerned with a connected body of demonstrated truths or with observed facts systematically classified and more or less colligated by being brought under general laws, and which includes trustworthy methods for the discovery of new truth within its own domain. Sir E. Ray Lankester's illustration rather confirms this view, for he says that the Académie des Sciences recognized various branches of knowledge as sciences, and that "very soon investigations made according to the rules laid down by those engaged in the building up of these 'sciences,' for the purpose of testing the soundness of conclusions and the systematic accurate application of those rules, were called 'scientific,' and the investigations so made and the resulting body of knowledge were called 'science.' The French Academy and the learned world generally definitely applied the word 'science' to all knowledge established 'scientifically,' that is, by the use of the scientific method." "In English speaking countries," he continued, "philosophers and the so-called 'men of science,' have more and more definitely insisted on the importance of the 'scientific' method and the limitation of the word 'science' to knowledge tested and brought into order by that method."

All this is not logomachy, mere word-splitting; it is of great importance to medicine at this time, and has a very direct bearing on Sir James Mackenzie's address published elsewhere in this issue. It is a very long address, but the time given to its perusal will seem short, for it is well constructed and written and shows the direction in which the mind of one of the most striking personalities of the medicine of our time is working. Many people during the last generation have got out of the way of looking on medicine as itself a science; we have allowed it to be regarded as no more than a technical occupation, drawing information from various sciences, but not in its own methods and material worthy to be reckoned a science. So widely has this opinion come to be entertained that it is even adopted and applied by the Inland Revenue! Sir James Mackenzie does not mention the doctrine in so many words, but all through his address he is in effect challenging it. He is directly concerned with rebuking us for not giving sufficient attention to prognosis; but to make his point about this he has to show that medicine does in fact use the scientific method, and that its study, in common with that of other sciences, is conducted by way of investigations made according to certain rules recognized by all men of science as appropriate for testing the soundness of conclusions. It fulfils also the further requirement demanded of a department of knowledge claiming the status of a science, in that it is concerned with a connected body of demonstrated truths and observed facts colligated — though, it is true, to a very inadequate extent — under general laws and possessing trustworthy methods for the discovery of new truths within its own domain.

Medicine is concerned both with truths that can be demonstrated by experiment and with facts that can be established by observation; the relation of its two parts is very much that of physics to astronomy; but while the fame of astronomy has been continually increasing in the ears of all men, the observational part of medicine has rather lost credit. Sir James Mackenzie in his zeal for it may seem here and there a little in danger of depreciating the experimental side, but there is small chance of any harm befalling.

It is, we believe, true that he is to some extent preaching to the converted, and that the physiologists, the pharmacologists, the pathologists, perhaps even the bacteriologists, are becoming alive to the true situation; they have begun more clearly to perceive that not only does medicine want their facts, but that they must understand the nature of the problems and difficulties of medicine, and must, in order to enjoy to the full the stimulus it can give to their own work, study its methods "for the discovery of new truths within its own domain." Sir James Mackenzie lays stress on medicine's methods other than the experimental, and in particular on those which must be used for the study of prognosis. The power to foretell is the most difficult and usually one of the latest to be achieved by any science founded on observation. The address is very severe in its criticism of modern medicine for its neglect of the study of prognosis; there is truth in what he says of the skill of practitioners of an older generation in this respect. He would attribute it, we gather, in part to the fact that, having to depend more on their own unaided observations, their senses became more highly trained and they got to know their patients better. The account

[1] *Studies in the History and Method of Science.* Vol. ii. Edited by C. Singer. Oxford: The Clarendon Press. 1921. (Imp. 8vo, pp. 581; 78 figures. 55 plates. 42s. net.)

he gives of his own errors, labours, disappointments, and successes is at once fascinating, instructive, and encouraging. The whole address is a moving appeal to the general practitioner of medicine to take his share, which is the most important share, in advancing this most difficult department of medicine. It is an appeal by one who knows of what he speaks, one who has himself trodden the arduous path he bids others follow.

THE SURGICAL TREATMENT OF ANGINA PECTORIS.

JONNESCO'S operation for the relief of angina pectoris[1] by excision of the sympathetic ganglia and interruption of centripetal paths from the aortic and cardiac plexuses, successful though it was in many respects, was not entirely satisfactory either from the physician's or the surgeon's point of view. No isolated piece of evidence could be. There is now another case to throw into the scales. In 1914 Rénon[2] had a female patient, 62 years of age, who was known to have had an aneurysm of the aorta since 1910; she was a woman of great energy, and she had suffered so severely from dyspnoea, thoracic and cervical pain, and headache that she declared herself desirous of operation, let the risks be what they might. The aneurysm, as revealed by *x* rays, was discrete, fusiform, situated in the ascending aorta, and surrounded by "considerable mediastinitis." Syphilis had been present but had been treated, and the Wassermann reaction was negative in 1914. Tuffier[3] attacked the case *qud* aneurysm—that is to say, he exposed the aorta by a transverse division of the sternum opposite the second intercostal space; found a fusiform aneurysm 2 in. long, beginning a finger-breadth above the origin of the vessel and of a circumference twice that of the normal aorta; he "isolated" it, and speaks of this as an easy matter, though one of the onlookers, Rénon, says it was the longest part of the operation. He then wound round and round the whole length of the aneurysm a long strip of fascia lata, applying two superposed turns just below the bulge, in such a way as slightly to constrict the normal arterial lumen.

The result of the operation seemed rather more satisfactory to the surgeon who operated, and who speaks of her as "free from functional troubles for four years after," than to the physician who subsequently treated her for "a sensation of intrathoracic cramp," for "pains in the back and neck," for "slight bronchitis," and who mentions that suppuration occurred in the wound round a silver suture in the sternum, accompanied by "violent pains in the thorax." In 1919 the Wassermann reaction was found to be positive once more, and further treatment was given. The woman died in 1920 of recurrence of carcinoma of the uterus, for which she had undergone hysterectomy earlier in that year. No necropsy was permitted.

Rénon's conclusions amount to this: The feasibility of the operation has been established, for the patient's death six and a half years afterwards was not to be ascribed to the aneurysm; there was some amelioration of symptoms; the general state was better, and the pains, though severe at times, were much less frequent than before. He thinks the improvement due to "liberation of the mediastinitis by dissection of the aneurysm," which, however, was not permanently reduced in calibre by the intervention.

It may be remarked that in view of the known relation between the development of an aneurysm and progressive deterioration of the muscular and elastic elements in the wall, and the lack of resistance displayed by all other tissues, encirclement by a band of fascia promised no more than postponement of the evil day, and seems to have accomplished little.

However, when Rénon's paper was read at the Académie de Médecine, Delorme imported great interest into the discussion by pointing out that whilst dissecting or freeing the aneurysm, in the admitted presence of mediastinitis, Tuffier must incidentally have divided or removed the sympathetic plexuses on the anterior and left aspects of the aorta, and that this made it necessary to seek another explanation of the relief of the angina. He referred to Jonnesco's interruption of the reflex arc by dividing the centripetal fibres from the plexuses to the bulb, and reminded his audience also of the work of Leriche,[4] who treated many war cases of ischaemic, or mixed ischaemic and neurotrophic "blighted" limbs by excising the sheath of the main artery. The surmise on which the operation is based is that by interrupting the sympathetic plexus about the vessel the surgeon secures dilatation of the vessels beyond, and recovery from palsy and trophic conditions, including matting of the tissues, supposed to be due to nerve injury.

This work of Leriche, Jaboulay, and Heitz, though it has found support from other surgeons,[5] needs further confirmation, for it has even been denied that vascular nerves pass distally as a periarterial plexus at all, and direct supply of the arteries from nerve trunks has been demonstrated. Still, it is established that severe organic changes in the vessels may result from lesions of nerve trunks, and it is agreed that, in whatever way the fibres reach the walls of the aorta stimulation of their terminals therein is the starting point of anginal pain. Delorme pointed out that such a regional sympathectomy can have only a limited application, and that, so far as the progress of an aneurysm itself is concerned, it might even be a menace. On the other hand, as a variant of Jonnesco's method it may find a value in the relief of symptoms. Delorme also made reference to his work on "cardiolysis"—more accurately known as "pericardiolysis"—which has a somewhat similar basis to the precordial thoracostomy referred to recently by Dr. Blackhall-Morrison[6] in our pages.

Rénon's case lends some support to the view that symptoms of cardio-vascular origin may be made amenable to surgery, and the report is welcome in that it affords still further witness to the turning of attention from the coagulation of contained blood to the condition of the containing walls in the treatment of aneurysm; it indicates a short step forwards towards the period foretold by Lauder Brunton, and indicated in greater detail by Vaquez,[7] when "irremediable" conditions associated with heart and vascular disease shall successfully be brought within the realm of surgery. Not the least of the benefits accruing from war experience is a greatly increased familiarity of a large number of surgeons with intra-thoracic intervention on the widest scale, which justifies operations, hitherto perhaps foolhardy, in the presence of urgent and unsupportable symptoms.

The medical profession may well congratulate both Rénon and Tuffier on their courage and their success.

[1] BRITISH MEDICAL JOURNAL, 1920, vol. ii, p. 793.
[2] Rénon, *Bull. de l'Acad. de Méd.*, 3e série, T. 85, No. 18, p. 528.
[3] Tuffier, *Bull. et Mém. de la Soc. de Chir.*, January 28th, 1920, p. 166.
[4] Leriche, *Lyon Chirurgical*, 1917, xiv, No. 4, July, p. 754.
[5] Burrows, BRITISH MEDICAL JOURNAL, February 1st, 1918, p. 199; Stopford, *Lancet*, March 30th, 1918, p. 465.
[6] BRITISH MEDICAL JOURNAL, 1920, ii, p. 840.
[7] Vaquez, *Bull. de l'Acad. de Méd.*, October 7th, 1919, p. 157.

AN ANNUAL STOCK-TAKING.

ANYONE who finds himself in doubt as to the exact nature of the claim of the British Medical Association on the interest and support of the individual practitioner, to whatever section of the profession he may belong, will find his difficulties speedily resolved if he can attend the annual meeting at Newcastle. For the meeting considered as a whole affords at once an exposition of the aims of the Association in their totality and a practical commentary upon the way in which the several portions of the machinery of the Association work.

As will be seen from the programme of the Sections of the Annual Meeting, published in the SUPPLEMENT, the subjects selected for discussion at Newcastle include not a few of those by which the mind of the profession is at present most exercised. The retiring President, Sir Clifford Allbutt, will introduce in the Section of Medicine the discussion on visceral syphilis, especially of the central nervous and the cardio-vascular systems; and it will be observed that the special Section of Venereal Diseases intends to concern itself rather with therapeutics than polemics. The Section of Surgery will hold discussions on acute pleural empyema, on compound fracture of the thigh and leg, and on the diagnosis and treatment of injuries of the intestines, and will have the opportunity of witnessing demonstrations by its president, Professor Rutherford Morison, and others. The Section of Orthopaedics and Diseases in Children will also hold three discussions—one on the early diagnosis and treatment of anterior poliomyelitis, the second on blood diseases in children, and the third on tuberculosis of bone. The Section of Obstetrics and Gynaecology will discuss Caesarean section, and the neurasthenic element in midwifery and gynaecology, the latter subject being introduced jointly by an obstetrician and a neurologist. In the Section of Radiology and Electro-therapeutics (in the presidential chair of which Dr. Knox at short notice takes the place rendered vacant by the lamented death of Dr. Ironside Bruce) there will be a discussion on the changes induced in blood constituents by radiations—a subject which will be examined both from the experimental and clinical points of view.

Abstract consideration of the programme of the meeting, though a poor substitute for the practical experience of those who can take part in it, will be sufficient to show that the work of the Sections, the deliberations of the various conferences, the addresses and social features of the gathering, fall into place as component parts of a conception which touches at some point the interest of every member of the profession. Three aspects of the Annual Report of Council, which forms the chief basis of the discussions at the Representative Meeting, may be distinguished. All of them are essential to full appreciation of its significance. As will be seen from its perusal (it was published in the SUPPLEMENT of April 30th), it is, in the first place, a record of work accomplished, a summary of the practical achievements of the Association during twelve months. In the second place, it is a review of the collective experience of the profession throughout the Empire, an account of the environment which must inevitably play a determining part in the development of the practice of medicine. Finally, it contains, in the recommendations to be laid before the Representative Body, the outlines of a policy for the immediate future.

In its first aspect the contents of the report need little emphasis. They are such as the series of reports which has preceded it have rendered familiar, and they will surprise only those who have accepted without investigation the old criticism that the British Medical Association is impotent or lethargic in fields other than those of science. As against such criticism it is shown how widespread is the Association's work in Australia, New Zealand, and South Africa, and how it is extending the sphere of its activity in the newly defined territories of Africa, in the Far East, and in the islands of the West Indies—successful in turn in the service of the individual member and of the sectional interest, in central action and in local. In definite increase of remuneration and improvement of conditions of practice, groups as diverse as the practitioners called to give evidence at courts-martial, the women practitioners in the service of the Metropolitan Asylums Board, and the practitioners in the Notts colliery area have alike profited, to quote at random from the full list, which, beyond equivocation or dispute, covers every field open to the qualified medical practitioner as such. The revision of the Draft Regulations under the Dangerous Drugs Act, 1920, balances these examples with an instance of action directly affecting almost every section in a greater or less degree. Such a record, besides its intrinsic interest, is a fitting background to the claim of the Association to represent the whole profession in a sense true of no other body. It should be kept in mind in any discussion of the negotiations with the Ministry of Health in respect of the constitution of a central committee representative of the whole profession, and suggests a new application of the old practical maxim, "What touches all should be approved of all," which underlies such negotiations.

As already pointed out, the significance of the report is by no means exhausted by a consideration of the successes achieved. It is essentially an epitome of professional experience during the period under review, and as such it records much work, the fruition of which is for the future. Such is the progress recorded in connexion with the model scheme for attendance on dependants of miners and other workmen, or the successful initiation of legislation for the security of tenure of public health officers. It includes also some instances of failure to attain objectives which seemed at one time well within reach. Such instances are instructive, for they illustrate two facts sometimes forgotten alike by critic and by partisan: first (as in the case of the postal medical officers) that the British Medical Association cannot act successfully for those members who cannot help themselves to the extent of expressing their views on matters touching their own interests; and second, that a period of peculiar difficulty will have to be met in the immediate future. More than once, as in the matter of superannuation for public health officers, the Council is obliged to report that the time is not opportune for further progress. This is simply to say that the medical profession cannot hope to escape the effects of prevailing economic conditions. Salaries and fees are not immune from the influences which have already brought about substantial reductions in the general level of wages, and threaten to retard if not to arrest the national works of reconstruction so hopefully undertaken after the armistice.

Amongst the other matters which call for particular attention, primarily from the section of the profession directly affected, but ultimately from all who are concerned in the general developments of the future, are the relations of certain sections with the Whitley Councils recently formed for the central (or national) and local government services; the position with

regard to the transfer of insurance practices; the ultimate form of the insurance record cards; and the lesson to be drawn from the Tasmanian Medical Act. Old foes with new faces are to be discerned here and elsewhere in the report.

So far, the report has been treated primarily as a record, and a few specific points selected for comment as an index to its general scope and character. For practical purposes, however, interest naturally centres upon the interpretation to be placed upon the experience recorded and the decisions which will determine the special direction of the Association's policy for the coming year. Apart from the recommendations touching the machinery of the Association, and the question of federation, which have been fully dealt with in recent leading articles, and the postponed discussion on the Reports of the Consultative Councils of the Ministry of Health, the main matters for debate (adopting the order in which they appear in the Report) are those presented under the headings of Medical Ethics, Medico-Political, and Hospitals.

Under the first heading comes a proposed definition of the attitude of the Association towards questions involving the principle of professional secrecy. The suggested solution lies in a sharp distinction between those cases in which the law as at present existing provides in the public interest for the communication of information obtained in the course of professional duties, and the case in which administrative action may tend to the enforcement of further exceptions to the rule of professional secrecy. It is recommended that the whole weight of the Association should be lent to initiate and support resistance to such encroachments. The second item of note is the proposed scheme for grading and remuneration of medical professors and teachers. A matter of sectional application in a limited sense, since the number of persons affected is numerically small, its importance to the teaching of medicine cannot be over-estimated. A decision is the more urgent because a general settlement of the problems of University teachers, so long overdue, might seriously prejudice the interests of the teachers of medicine, failing some authoritative exposition of their case for special consideration. Last come the two series of recommendations covering respectively the question of the future of the voluntary hospitals, and the utilization of the Poor Law infirmaries. Events of the last few months have brought problems of this order into prominence, and the urgency of forestalling either a national settlement or local experiments which may harden into local custom and finally secure establishment through national legislation, has apt illustration in the Bradford episode.

The whole hospital question, complicated as it is by the workings of what may perhaps be characterized as the "vested sentiment" of the community, demands the exercise of the highest qualities of statesmanship. The medical profession has to convince the public that its contribution to the settlement so impatiently demanded is determined in the long run by a correct interpretation of the public need, rather than by motives of professional self-interest. Only so can it hope to ensure that the adoption of some short cut to an immediate solution will not indefinitely postpone constructive measures of reform. A great step forward is marked by the measure of agreement amongst the honorary staffs of voluntary hospitals obtained through the medium of the Association and embodied in the recommendations contained in the first series. It is not sufficient, however, to deal with the readjustment of the old system. The recommendations on the voluntary hospitals have to be supplemented by recommendations on the future utilization of the Poor Law infirmaries. Agreement upon the guiding principles to be accepted on this subject will be no unimportant contribution, alike to the needs of the profession and to the orderly development of the health services of the country.

INTERNATIONAL HEALTH WORK.

It has long been recognized that measures directed to the prevention of disease cannot achieve their full purpose unless they are international in character. This view was held by those engaged in the peace negotiations in Paris in the early months of 1919, and as a result Article XXIII of the Covenant of the League of Nations binds the members of the League to "endeavour to take steps in matters of international concern for the prevention and control of disease." The practical outcome of this conclusion is the establishment of a permanent International Health Section of the League of Nations and the formation of an Industrial Hygiene Department of the Labour Section of the League. This department is concerned with the "protection of the worker against sickness, disease, and injury arising out of his employment." With a view to assisting the International Labour Office in the solution of problems connected with industrial hygiene an advisory committee is now being formed which will include Government medical inspectors of factories and experts attached to organizations of employers and workers or to industrial establishments. International agreements have already been secured through the instrumentality of the Labour Office with regard to measures for the prevention of anthrax and in connexion with lead poisoning, and these two questions will be discussed at the October meeting of the International Labour Office. In this country provision was made in the Factory and Workshop Act, 1901, with respect to cases of anthrax or lead poisoning contracted in a factory or workshop. Notification of both diseases occurring under the circumstances named must be made by the medical practitioner in attendance to the chief inspector of factories at the Home Office, and the employer is required to give notice of the cases to the certifying surgeon and the local factory inspector. In those factories in which lead processes are carried on and where women or young persons are employed, suitable washing conveniences must be provided, meals must not be taken in rooms where lead is used, and mechanical means must be installed for carrying off the dust. Periodical examination by the certifying factory surgeon of workers in lead is included in the preventive measures in force. Regulations have been made with respect to factories and workshops in which infected hides or wool are handled. These include the provision of washing conveniences with a supply of soap, towels and nail-brushes, the compulsory washing of the hands before partaking of food, the non-employment of a worker who has an open sore or cut, and the provision of suitable fans for the extraction of dust. In carrying out its task of protecting the worker against disease arising out of his employment the International Labour Organization will receive material assistance from the pioneer work of the Home Office, initiated and carried out by Sir Arthur Whitelegge when he held the position of H.M. Chief Inspector of Factories; of his labours it is impossible to speak too highly.

THE EPIDEMIC OF UNREST.

At a meeting of the Society of Arts on May 25th Dr. C. M. Wilson read a paper on "Some effects of the war on industrial unrest." His remarks were for the most part a careful analysis of the present mood and temper of labour. To begin with, he distinguished the case of the

man who had seen active service from that of the man who had remained at home. The latter, if he had done so involuntarily, and had been a target of abuse, was filled with a sharp sense of injustice, and if he had avoided active service without any valid reason he was suffering from a loss of self-respect proportional to the good that was in him. In either event his mental state was morbid, making him much more difficult to deal with than the ex-soldier. In such a soil grievances flourished, and such a man became unduly eager to exhibit his valour in different directions. From this Dr. Wilson passed on to describe some of the causes that led to unrest in the trenches, such as the "cooking" of war news for home consumption and the decline in authority consequent upon the perception that the mental outfit for leadership was generally lacking. Men in the mass were now more critical than before the war, and were less inclined to believe what they heard and read. They had been prepared by the war for an appeal based on something higher than self-interest, and the opportunity had not been taken by employers. He regretted that the captains of industry had not generally followed the example of the officers of the old regular army in devoting themselves unselfishly to the needs of the men, and giving them that personal leadership which had proved its value in the field. The discussion on Dr. Wilson's paper was somewhat diffuse, but it was made interesting by Dr. Graham Little's testimony to the working man—all members of the medical profession, he said, who were privileged to come into contact with the working man had a very high opinion of him—and by Dr. Charles Buttar's footnote to Dr. Wilson's theme. Dr. Buttar contested the implication in the title of the paper; unrest was not confined to the industrial population, and he doubted whether it was caused by the war, for possibly the war itself was only a symptom of a larger unrest. To his mind the epidemic of unrest was due to the want of a satisfying object in life, to love of money, and the false pursuit of happiness. He saw no hope of happiness in many of the weird cults and beliefs which were taking the place of the ancient faiths; nor was true happiness necessarily to be found in rolling along high roads in luxurious cars; nor, again, was the smashing of the machinery of civilization in a crusade of labour against capital likely to bring about the millennium. He believed that salvation would only be found in a return to ideals similar to the old ideals—a faith for some, work for most, and a sense of duty for all. This sentiment drew the warmest applause of the evening.

TELL-TALE TREATMENT.

AMONG the kings of France one of the best known to readers of English literature is Louis XI. This is due to the genius of Scott, who, in his portrait of the King, drew a picture of mingled astuteness, cunning, cruelty, and superstition not easily to be forgotten. Attempts have been made to whitewash him, and no doubt by his successful efforts to curtail the power and independence of the greater feudal nobles he had a share in the unification of France. But Scott's view of his character is that generally accepted, and reflects the opinion of Louis's own time and of the majority of French historians. In a volume reviewed elsewhere in this issue Dr. Cabanès has come forward with a suggestion which may explain, if it does not excuse, some of the darkest traits in Louis's character. The suggestion was made in the course of some lectures on the light clinical medicine may throw on general history, and was given as an illustration of the doctrine *naturam morborum ostendunt curationes* — the method of treatment indicates the nature of the disease. Louis XI on one occasion wrote a letter to the Prior of Notre Dame de Salles at Bourges as follows: "Master Peter, my friend, I beseech you as earnestly as I can at once to pray to God and Our Lady of Salles for me that they may be pleased to send me a quartan fever, for I have a disease of which the physicians say that I cannot be cured without having it; and when I shall have it I will straightway let you know." Voltaire had read the letter and was very scornful about it, but he did not read it with sufficient care. He says that the King asked to be granted quartan fever, which would be good for his health, and exclaims, "The impudent quackery of the doctors was as great as the stupidity of Louis XI and his stupidity equal to his tyranny." But Louis did not say that a quartan fever would be good for his health; he said that he had a disease which could not be cured unless he had a quartan fever; the only conclusion the statement justifies is that Louis had a disease worse than a quartan fever, and this Voltaire might have perceived had not his anxiety to find a stick with which to beat the doctors blunted his customary acumen. Dr. Cabanès recalls the observation attributed to Hippocrates and well known to mediaeval medical writers who founded themselves on him. It was thus stated by one of them, "if an epileptic is once seized with quartan fever he is better for the most part of his time." Dr. Cabanès's suggestion is that Louis suffered from epilepsy; if he did it would account for a good many things about him, his fits of moroseness, for instance, and his periods of seclusion. Dr. Cabanès can explain why the King addressed his request to the Prior of Notre Dame de Salles; it was because that sanctuary was much frequented by pilgrims from the ague-stricken district of Sologne where there is still much marsh land. In no other sanctuary, Louis might argue, would the way in which fevers were contracted be better understood or the supply larger. On another occasion Louis made inquiries about Notre Dame d'Embrun, a sanctuary with a reputation for the cure of epilepsy. Dr. Cabanès finds confirmation of his suggestion in other facts known about remedies taken by Louis, since among them were many deemed useful against the falling sickness; in this way the dark stories of how the King took baths of human blood may be accounted for, since to drink human blood was sovran against epilepsy. Possibly the King had also some other disease; a contemporary affirmed that he had leprosy or something like it. In 1483 Louis sent an expedition at considerable cost to the Cape Verd Islands, the purpose of which has puzzled historians. One of these islands was it is said, visited by lepers in the hope of cure; the treatment consisted in rubbing the skin with the blood of tortoises, which were plentiful there, and eating the flesh and fat. Perhaps Louis had some chronic skin disease, or possibly he thought that tortoise blood might be better for epilepsy than human blood. Whatever we may think of this, Dr. Cabanès's first conjecture about quartan fever is a good illustration of his thesis.

A MEDICAL PRIME MINISTER.

M. EMILE COMBES, once Prime Minister of France, died on May 25th, at the age of 86, at Pons, a small town on the road between Cognac and Bordeaux, where at one time he had practised medicine. He was a southerner and was born of poor parents in the department of the Tarn. He was educated at Roman Catholic seminaries, and as a young man taught in Roman Catholic colleges at Nimes and Pons. At the age of 25 he wrote a book on the psychology of St. Thomas Aquinas, but his opinions underwent a revolution, and two years later, at the age of 27, he determined to begin the study of medicine in Paris; he took the degree of M.D. in 1868 and settled in practice in Pons. The first public office to which he was elected was that of Mayor of Pons; in 1879 he was elected a member of the Conseil Général of the Department of Charente Inférieure, a body possessing powers in some directions greater and in others smaller than a county council in England, but exercising more political influence. Combes was defeated when he attempted to enter the Chamber of Deputies in 1881, and it was one of the peculiarities of his career that he never

belonged to that body. He was elected to the Senate in 1885, became its vice-president in 1894, and remained a member of it until the end of his life. His first portfolio was that of Education and Public Worship in 1895, and though the ministry only remained in office for six months Combes gave sufficient indication of his anticlerical disposition to alarm the moderate parties. His views, however, were popular, and his influence grew steadily during the ministry of Waldeck-Rousseau (1899–1902); in June, 1902, he became Prime Minister. Under Waldeck-Rousseau a law had been passed requiring the religious orders to obtain from the State authorization to continue their work. Combes, with the support of the parliamentary party which went by the name of the Bloc, broke off relations with the Vatican and withdrew from the religious orders the right to teach in France; he was no doubt, for all practical purposes, justified in saying that the concordat established by Napoleon was then brought to an end, though it was left to his successor to complete the separation of the churches from the State. While engaged in this bitter controversy at home, in his conduct of foreign affairs M. Combes sought to make friends for France by pursuing a policy of conciliation, and his hope was to find in arbitration a safeguard against war. He entered into arbitration agreements with Great Britain, Italy, Holland, Norway, Sweden, and Spain. After the resignation of his ministry in 1905 he seemed to retire, but continued to play a considerable part behind the scenes and made and unmade more than one ministry. During the war he subordinated any personal ambitions he may have retained to the common good, and was a member of M. Briand's Cabinet (1915–16). Thus, of the Prime Ministers of France in this century, two of the most conspicuous, Combes and Clemenceau, were members of the medical profession. The qualities which brought the latter to power are easy to comprehend, but it is not so easy for a foreigner to understand the sources of the influence Combes exercised on the course of French politics. It was unquestionably great, and for nearly twenty years he was probably the most prominent of French politicians. His success is the more surprising since when he entered on a political career he was much older than most men who attain success in it; he was then 50 and had spent some twenty years in the arduous work of a doctor in a country district. His influence, it would seem, was in large measure due to a certain honesty and simplicity of character which he retained to the end.

IMMUNITY AND INDUSTRIAL DISEASE.

BEFORE the Royal Society of Arts, on May 30th, Sir Kenneth Goadby read a paper on immunity and industrial disease. Very little, he said, was known of individual susceptibility and immunity to many of the corrosive substances used in manufacture; thus, in the dyeing of yarn with chrome, certain workers suffered from ulceration after a very short time, while others had a slight but recurrent dermatitis which only after long exposure degenerated into deep and penetrating ulcers. In this instance natural immunity and susceptibility played leading parts in the appearance of the disease. Individual susceptibility explained many curious forms of ulceration seen in such trades as confectioners, drug manufacturers, felt hat makers, and the fur trade. Diseases arising from dust, fumes, and vapour comprised a large section of industrial disease, and amongst the air-borne diseases lead contributed by far the largest number of cases. The high incidence of lead poisoning in the painting trades was difficult to understand, as lead-dust inhalation was the chief source of lead poisoning, and except in dry rubbing down the painter is not exposed to lead dust. An acute attack of abdominal pain often followed breathing the air of newly painted rooms; it was due, the lecturer believed, to turpentine poisoning. Arterio-sclerosis, resulting in increased blood pressure, was admitted to be a common disease among painters; a comparison of the blood pressure of painters working with leadless paint for some years with the blood pressure of workers engaged in the manufacture of white lead showed that the latter as a whole had a much lower blood pressure, according to their age group or according to the period for which they had worked, than painters. The painter's occupation, therefore, apparently entailed some risk contributing to high blood pressure not present amongst the white lead workers; this might be associated with the vehicle used for the paint, the chief constituent of which was turpentine and its substitutes. While ailments common to the whole population might be augmented by industrial disease, it was equally true that minor affections predisposed to industrial diseases, especially the large category of small but persistent microbial poisons emanating from septic mouths, unhealthy tonsils, persistent catarrh, and long-continued constipation, all and each of which sooner or later diminished the power of the blood to resist other poisons. The fact that individual susceptibility and immunity were factors in determining much of the special disease in dangerous trades suggested certain general blood tests, whereby susceptible persons could be eliminated from an occupation inimical to their well-being. The blood tests were simple, and the estimation of blood pressure an ordinary routine of medical practice. A selection of workers for especially dangerous processes, following the general indications outlined—for instance, alterations in blood pressure and the white cells of the blood after a short exposure to the dangerous trade influences—would, the lecturer urged, not only reduce the incidence of industrial poisoning in many occupations, but might even render safe some trades now regarded as dangerous. The great proportion of the work in dangerous trades was non-skilled, so that no hardship would arise from an elimination of susceptibles. Even the painter served an apprenticeship, and during the earlier time was a labourer; two special examinations, one at three and one after six months' employment, would be sufficient to eliminate susceptibles. The general principle of selection for a given occupation was carried out to some extent in many walks of life, and it did not seem unreasonable to extend the method. A trade union organization charged with the general improvement of the health of its members would have the whole-hearted co-operation of the public at large and command universal attention.

PEARL PATHOLOGY.

As there is a very general but erroneous impression that a pearl is formed around a parasite, as the process is, in fact, pathological, and as the production of the Japanese artificially induced "Mikimoto" pearl is a curious example of minute plastic surgery, the following notes, founded on a paper published last week in *Nature*, by Dr. H. Lyster Jameson, who announced Mikimoto's first successes to the Dundee meeting of the British Association in 1912, possess some medical interest. It is first to be noted that certain small pearls which have no commercial value are produced in Mytilus by the specific stimulus of a trematode. How pearls such as those produced by the Ceylon pearl oyster originate has not been ascertained. Only in a few instances are foreign bodies, such as radiolarian shells, sponge spicules or quartz grains, found at the centre of the pearl. Usually the nucleus is composed of a kind of shell substance of pathological origin, identical with that with which the oyster repairs an injury to its shell. The free surface of the mantle of an oyster is formed of cylindrical ciliated epithelial cells; the shell is produced by the outer shell-secreting epidermis, consisting of cubical cells. If a foreign body, such as a piece of mother-of-pearl, is inserted between the shell-secreting epidermis and the shell, shell substance is laid down, forming what is called a blister, more or less hemispherical, projecting from the shell and continuous with

its inner surface. By this method the Chinese induce fresh-water mussels to coat tiny images of Buddha with mother-of-pearl, and a similar experiment was carried out by Linnaeus in the eighteenth century. The coated images are merely curiosities and the commercial value of the blistered pearls is low. Mikimoto has got far beyond this; the natural pearl is formed in an epithelial sac, which has somehow been formed in the parenchyma of the mantle or muscle. It is this epithelial sac that Mikimoto imitates, a process demanding the most delicate and skilful manipulation. The shell of a pearl oyster is removed and a bead of nacre or other suitable nucleus is laid down on the outer, shell-secreting, epidermis of the mantle. The epidermis is then dissected off, and wrapped round the nucleus to form a sac; the neck of the sac is then ligatured. This sac is next transplanted into a second oyster and embedded in the parenchyma of its mantle. The ligature is then removed, astringents applied to the wound, and this second oyster with its grafted pearl sac containing the mother-of-pearl bead, is returned to the sea, where it remains for several years—seven or more—until a coating of pearl substance of sufficient thickness is secreted around the introduced bead. A pearl can be formed only in a pearl sac, which, as has been explained, is a closed cavity lined by nacre-secreting epithelium. Apparently a pearl sac must owe its origin to a traumatism of some kind, unless we suppose that it may be a congenital deformity.

VITAMIN.

RECENTLY in a note upon the spelling of chemical terms (April 9th, p. 539), it was stated that the rule of the Chemical Society must be interpreted to require the spelling of vitamin without the terminal "e." A correspondent now inquires as to the pronunciation. We had supposed that there could be no doubt that the first syllable was long and the "i" in it produced in the English manner (according to the analogy of "vital"). On the question of length we have consulted Sir Clifford Allbutt, who has no doubt that the first syllable is long—vīta. "I have," he says, "looked in such lexicons as are at hand, to see if at any time the length was in varied use, but find no authority for any short use. No doubt in coining the word vitamin vita was used in no antiquarian, but the ordinary sense: 'tenues sine corpore vitae' (*Aenid*, vi, 292)." We have heard the word pronounced with the "i" as "ee" in Continental fashion, but we believe this to be unusual. The word was coined by Casimir Funk, who thought these bodies contained amines and even gave a formula for them. As he regarded them as necessary to life he called them "vitamines." They are, however, not amines. The term used by Professor Gowland Hopkins, "accessory food factors," which is descriptive and non-committal, would be the best hitherto suggested were it not so long. Professor Armstrong proposed the word "advitant," indicating simply that the substance is necessary to life; but it is an awkward and ugly word. Dr. John Brown suggested "vitaids" (an awkward word) and also "biogen," which, by suggesting the analogy of fibrinogen and so on, seems to us bad. Probably "vitamin" is too well established to be displaced, and we notice that Colonel McCarrison, in his book just published, to which he gives the title, *Studies in Deficiency Disease*, speaks throughout of "vitamins."

SURPLUS MEDICAL STORES.

THE Surplus Government Property Disposal Board has lately arranged with the Joint Council of the Order of St. John and the British Red Cross Society to offer surplus army medical stores and hospital equipment for sale on special terms to hospitals and kindred institutions. It is hoped by this means to aid the voluntary hospitals in meeting the urgent economic problems that now face them, and at the same time to benefit the taxpayer. The stores have been brought from the various collecting posts throughout the country into one large dépôt at Shepherds Bush, where they have been examined and graded into two categories—the new and the used or partly worn—the latter having been overhauled, adjusted, and renovated. The total value of the stores, now collected in a vast hangar near Wood Lane Station, is about one million pounds. They include a large amount of dental and *x*-ray appliances, half a million surgical instruments, a great deal of operating-room furniture, and about fifty tons of drugs. The arrangements have been carried out under the direction of Sir Howard Frank, the new chairman of the Disposals Board, and Sir Napier Burnett, M.D., chief executive officer to the Joint Council. A catalogue has been printed and every item in the sale list is now being priced at a level which it is hoped will offer a strong inducement to the hospitals and nursing institutions of the country to replenish and renew their equipment. The dépôt will be open for the inspection of the goods on June 14th, and will remain open each day, except Saturdays, until further notice. Invitations have been sent to hospital authorities to visit the dépôt, and no one will be admitted to it without an official permit from the Hospital Service Department, 19, Berkeley Street, W.1. Permits will be issued to 100 hospitals each day, but no sales will be effected until all the hospitals have had an equal opportunity of viewing the goods and making their choice.

LANGLEY PRIZE IN TROPICAL MEDICINE.

A PRIZE has been instituted at the London School of Tropical Medicine in memory of the late Dr. W. H. Langley, C.M.G., Principal Medical Officer of Southern Nigeria, who died in 1912. The fund was raised principally on the coast. The war intervened and all the papers and subscription lists went down in the ss. *Umgeni*, when Dr. Lynch Burgess, of the West African Medical Service, who was treasurer of the fund, lost his life. Dr. Thomas Hood, C.M.G., and Major Gerald Bell, two of those originally connected with the movement, have made the arrangements for setting up the memorial in connexion with the London School of Tropical Medicine. The prize (about £30) is to be awarded triennially and is open to competition among officers of the West African Medical Staff, whether on the active or retired list. The award will be made in respect of the best paper written on one of the following subjects: (*a*) Tropical medicine or surgery, (*b*) tropical hygiene and sanitation, (*c*) tropical entomology and parasitology. The first award will be made in 1924. Papers should be delivered to the Secretary, Seamen's Hospital Society, Greenwich, S.E., on or before October 1st, 1924.

THE ANNUAL MEETING AT NEWCASTLE.

THE Honorary Local Secretaries of the forthcoming Annual Meeting at Newcastle-on-Tyne are becoming anxious to know how many members they may expect, in order that arrangements may be made for the accommodation of visitors. It is particularly requested that early use may be made of the form of notification of attendance, printed in this week's SUPPLEMENT, at p. 217. Detailed information about accommodation in hotels, hostels, and lodgings in Newcastle and neighbourhood was given in the SUPPLEMENTS of May 7th and May 21st.

DR. F. L. GOLLA will deliver the Croonian Lectures before the Royal College of Physicians, London, on Tuesdays and Thursdays, June 9th, 14th, 16th, 21st, at 5 o'clock. The subject is "The objective study of neurosis."

WE regret to record the death of Professor Giorgio Ballerini, director of the school of obstetrics at Perugia, who served with distinction in the Italian army during the war.

Medical Notes in Parliament.

[FROM OUR PARLIAMENTARY CORRESPONDENT.]

Washington Labour Convention.

AN animated debate took place on May 27th on a motion by Mr. Barnes that the conventions adopted at the International Labour Conference in Washington under the League of Nations should be submitted to Parliament.

Mr. Barnes's case was that the "competent authority" to which the conventions were to be referred in each country wherein a Parliament existed was Parliament, and that ministers had no right to decide whether or not ratification should take place. It appeared that three departments were concerned—the Home Office, the Ministry of Labour, and the Ministry of Health. The Home Office had given effect to three conventions touching the nightwork of women, the nightwork of young persons, and the age of admission of children to industrial employment. By the Women and Young Persons (Employment in Lead Processes) Act, 1920, effect was given to the recommendations as to lead poisoning. To the other three recommendations with which the Home Office had to deal—anthrax, Government health service, and the prohibition of white phosphorus matches—effect was already given. The Ministry of Labour and the Ministry of Health were interested in the remaining conventions—eight hours labour and maternity. Mr. Barnes explained that he did not vote for the last named recommendation, but he held, nevertheless, that all these conventions should be considered by Parliament.

Dr. Macnamara met the motion with an amendment asking the House to declare that in existing circumstances it was inexpedient to give legislative effect to the convention on hours of labour. He held (with the support of the Attorney-General) that the "competent authority" to which all the conventions were to be referred to decide whether they should be ratified or not was the Government; but did not rest his defence on that ground. He suggested, in fact, that the eight hours labour issue could be discussed on his amendment, and said that the Government objection to the convention was that it cut across agreements made with trade unions. In regard to the refusal of the Government to ratify the maternity convention he quoted a reply made by Dr. Addison as Minister of Health, when the matter was raised on March 22nd. Dr. Addison then said that the proposals of the Washington Convention were that provision should be made for the six weeks preceding and the six weeks following confinement in employed women. This country had the Insurance Act, which provided maternity benefit for women who were themselves workers or the wives of employed contributors. Parallel with that, and administered by local authorities, was a system for giving assistance and advice in connexion with maternity and child welfare generally. These recommendations cut right across the whole of that system, which has been gradually built up in this country far in advance of any other country. Dr. Addison further said: "Our system provides that not only the women employed, but the women who are the wives of employed contributors, although they themselves are not employed, shall also benefit. . . . These recommendations apply to about one-ninth of the married women of a particular class in this country, and to one-ninth only. But we have done something for the remaining eight-ninths."

Viscountess Astor thought this answer unsatisfactory and urged that this convention should be brought before Parliament. The object of the Convention was to protect women who through the illness of their husbands or through their husbands not getting sufficient wage were forced into industry and had to work up to the very last hour before their confinement, and had to get back perhaps in a week's time. It had been suggested that if the recommendation were adopted many women would go into industry before childbirth so as to get benefit. She did not believe they would do that if they could help it. She asked that the Minister of Health should consult a committee representative of women's societies.

Dr. Macnamara's amendment was carried by 109 votes to 69, but on further appeal he promised to give an opportunity for discussion of the reasons why the Government had declined to ratify the Maternity Convention or the Hours of Labour Convention; and that this opportunity should be afforded before the period for ratification expired, which he believed was in July.

Ministry of Pensions Medical Officers.—In reply to Lieut.-Colonel Croft, on May 30th, Mr. Macpherson said that, with the approval of the Treasury and after consultation with the Ministry of Health, the Ministry of Pensions had given a four years' contract, terminating on March 31st, 1925, to a number of full-time salaried medical officers whose employment had previously been subject to one month's notice. Lieut.-Colonel Croft asked whether the Minister of Pensions would undertake that the services of those doctors at present employed under the Ministry of Pensions who sacrificed their practices to join the army and navy at the outbreak of the war and were on active service, and are now dependent solely on their salaries, would be retained at the Pensions Ministry in preference to those who were already drawing big pensions in addition to their salaries and those who had never served abroad. Mr. Macpherson said that practically the whole of the full-time medical officers of the Ministry served during the late war, and, other things being equal, preference for retention would continue to be given to medical officers who saw active service over medical officers in the same class who did not so serve.

Public Health Officers' Bill.

This measure, which was introduced by Sir Philip Magnus, and recently obtained its second reading, was taken in Grand Committee of the House of Commons on May 26th.

Its object is to give to full-time medical officers of health of local authorities and sanitary inspectors, security in tenure as is enjoyed by Poor-law medical officers, metropolitan medical officers of health, and medical officers appointed by county councils. The term sanitary inspector covers "inspectors of nuisances," and is henceforth to be used in all cases. Sir Philip Magnus stated that an Order in Council already provided that medical officers appointed in the future should be protected from dismissal except with the Minister's sanction. Mr. Myers, for the Labour Party, supported the measure as in the public interest—namely, to strengthen medical officers in the performance of their duty by enabling them to discharge it without fear. He referred to the difficulty which otherwise was sometimes experienced in condemning an insanitary area. A new clause was inserted, at the instance of Sir Kingsley Wood, for the Government to lay down that the bill should apply to medical officers and inspectors, whether appointed before or after the Act, but not to those cases where no grant was received from the Government. It was stated that these ruled out only about twenty-five authorities, mostly large, and in these the independence of the officers is practically secured by the size of the authorities. The bill was ordered to be reported to the House of Commons.

University and College Grants.—Mr. Hopkins asked, on May 26th, what were the principles and regulations under which the University Grants Committee was to recommend the distribution of the Parliamentary Grants recently approved by Parliament for the coming quinquennium; was it an implied condition in the allocation of financial aid to University Colleges from the extra grant voted by Parliament, that they should obtain equal financial assistance from local authorities; and was this principle also to be applied to grants made for the formation of clinical units in the hospitals; had the principle of giving building grants to University Colleges been authorized, and if so, what were the principles in which such grants were to be made; and was it intended to supply Government funds to raise the salaries of the more important professors in University Colleges to the same figure—namely, £2,000 per annum, as had been fixed as the salaries of the professors of the newly instituted clinical units in the hospitals. Mr. Young, Financial Secretary to the Treasury, replied that the general principles on which the University Grants Committee based their recommendations for the allocation of grants, were set out in the Report of the Committee dated February 3rd, 1921, and in the letter to Sir William McCormick printed as an appendix to the Report. Great importance was attached to the amount of support provided from local sources in calculating the grants payable to the different institutions, but except in the case of the University of Wales, there was no undertaking by the Government to make grants on the basis of pound per pound in respect of rate aid. The Committee were authorized to recommend capital grants for sites, buildings, and permanent equipment, if the funds at its disposition allowed, but no such recommendations had yet been made. The responsibility of fixing the salaries of the teaching staffs rested with the authorities of each institution.

Tuberculosis Treatment.—Sir A. Mond, on an inquiry by Mr. Ronald McNeill, denied that regulations had recently been made with respect to the institutional and other treatment of tuberculosis, by county and borough councils.

Universities (Scotland) Bill.—Mr. W. Graham asked, on May 26th, whether the text of the Universities (Scotland) Bill, 1921, had been supplied to education and other bodies in Scotland; whether the bill had yet been presented to the House of Commons; and when Scottish members would be supplied with copies of it. The Secretary for Scotland replied that a Universities (Scotland) Bill was submitted to him with the approval of the University Courts of the four Scottish universities, but he was not aware if the bill in that form was considered by any education bodies other than the University Courts. He was considering the possibility of introducing a Universities Bill; that he had in view was substantially the measure of the University Courts. He feared that it would not be possible to make progress with such a bill this session, but he hoped that he might be able to introduce it so that its provisions might be considered by persons interested.

Milk Prices.—Mr. Baldwin, in answer to Colonel Newman on May 26th, said that the producers' average price for milk in May, 1920, was 1s. 3d. a gallon; in May, 1921, it was 1s. 2d. a gallon. The average retail price per quart in May of both years was 8d. A comparison of the figures was, however, fallacious for three reasons: (1) The milk trade was this year fixing a single retail price for the whole summer, and the May figures could not accordingly be taken as a basic standard of comparison; (2) wages had been increased in pursuance of the Trade Board award; and (3) there was a considerably increased loss on the portion of the supply converted into cheese.

Use of White Lead in Painting.—Lieut.-Colonel Sir J. Gilmour (for the First Commissioner of Works) stated, on May 30th, in answer to Major M. Wood, that the practice of the Office of Works for the last fourteen years had been to use paints with a non-poisonous zinc base instead of a white lead base, and all contracts involving painting stipulated that no paint must contain more than 5 per cent. of soluble lead.

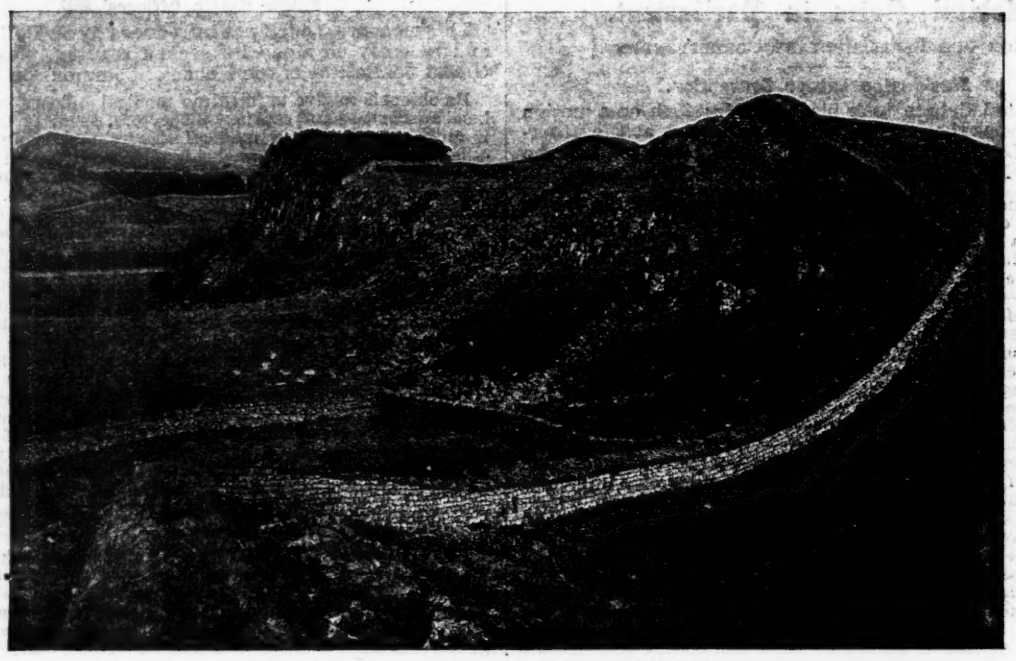

FIG 1.—Roman wall looking east towards Housesteads.

EIGHTY-NINTH ANNUAL MEETING

of the

British Medical Association,

NEWCASTLE-UPON-TYNE, 1921.

LOCAL ANTIQUITIES.*

THE GREAT WALL.

SOME of the most interesting relics of the Roman occupation of Britain are to be seen in Northumberland, and they all centre round the system of fortifications known as the Great Wall. It is the stone wall and its supporting stations of which so much remains, but the system included an earth wall known as the Vallum, and other earthworks, military roads with bridges, mile-castles, turrets, stations, and townships which flourished under the protection of the great barrier and its garrisons. Remains which have been abundantly found in the district not only show the great military strength of this outpost of the Roman Empire, but indicate that at times the settled quietude of the exiles from sunny climes encouraged the establishment of refinement in living and the cultivation of the gentler arts. Kipling, in *Puck of Pook's Hill*, has given a vivid picture of what life on the Wall may have been, but the pilgrim, as he contemplates the vast ruins of man's pertinacity, grass-grown and solitary, must be impressed with the mutability of human affairs.

> Cities and Thrones and Powers
> Stand, in Time's eye,
> Almost as long as flowers,
> Which daily die.

The Great Wall stretched from Wallsend, near the mouth of the Tyne, to Bowness on the Solway, a distance of seventy-four miles. It represents, not the Roman frontier in the North, nor a fence to keep out the Picts and Scots, but a series of military posts linked together so as to enable the garrisons to assemble quickly at any one point either for attack or defence.

The outstanding feature of the Wall as a whole is its direct route across country, only deviating from the straight to take advantage of some strategic point, and never fearing to skirt a veritable precipice or to dip straight into the deepest valley (Fig. 1).

The dimensions are estimated to have been 20 feet high, with a width of about 8 feet; while the fosse to the north was 30 to 40 feet wide and 12 to 15 feet deep. At no place is the ruined wall now more than 8½ feet high, and for the most part only a few courses remain, but in certain places the fosse has been better preserved, and is still probably of its ancient dimensions.

The structures that were formed for the accommodation of the soldiery who manned the wall consisted of stationary camps, mile-castles, and turrets. About every four miles there was a station. These were military cities suited for the accommodation of the chief who commanded the district and the garrison under him. These stations are quadrilateral in form, and consist of a strong wall with fortified gates; the wall encloses an area of from three to five acres, on which the military offices, public offices, and houses were erected. Their position was often elevated and exposed, and some of them, as that at Housesteads, are in the wildest part of Northumberland.

In addition to the stations, Castella or mile-castles were distributed all along the wall at this distance from one another. They measured about 60 ft. by 50 ft., and were merely for the accommodation and protection of the soldiery. The turrets were little more than stone sentry boxes recessed into the great wall; three or four were placed equidistant between each mile-castle.

Visitors to Newcastle should take the opportunity of visiting one or more of the camps which are within easy reach of the city, for here can be pictured something of the life of the men who garrisoned the wall.

One of the largest and best preserved of these camps is at Cilurnum or Chesters, about eighteen miles by the direct road from Newcastle (station, Humshaugh, North British Railway). Here one may see the remains of the bridge across the Tyne, a Roman villa, and a museum of Roman antiquities, which is one of the best of its kind in the country.

Of the situation the Rev. John Hodgson has said: "The

* Previous articles on the history, institutions, and industries of Newcastle have appeared in the BRITISH MEDICAL JOURNAL of December 11th, 1920, p. 902; March 12th, 1921, p. 391; and April 16th, 1921, p. 577.

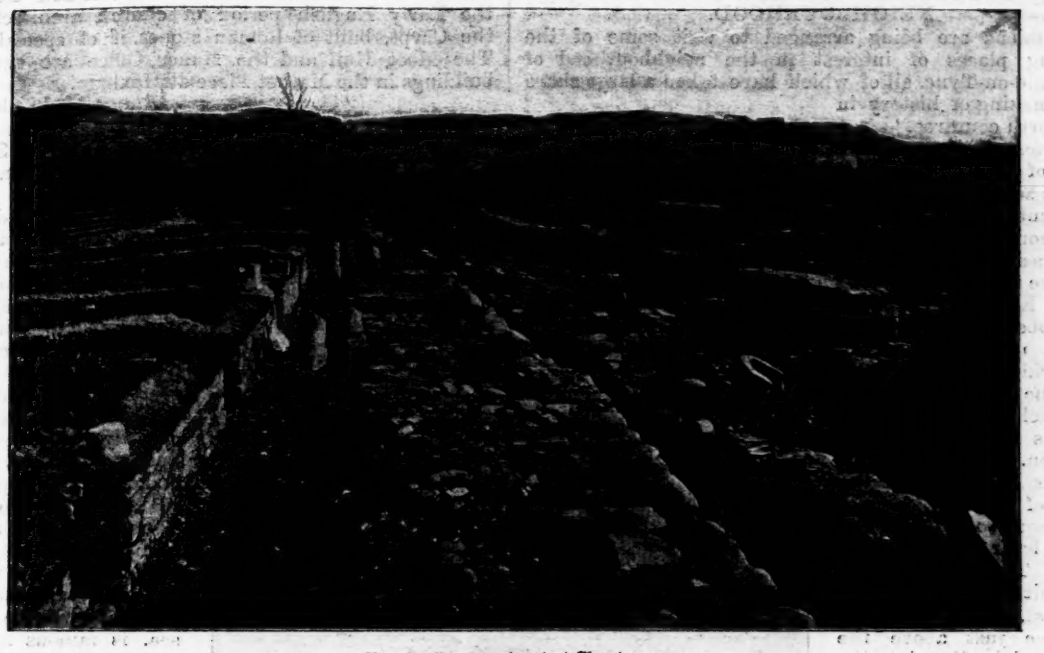

FIG. 2.—Roman street at Chesters.

Astures, in exchanging the sunny valleys of Spain for the banks of the Tawny Tyne, might find the climate in their new situation worse, but a lovelier spot than Cilurnum all the Asturias could not give them."

The camp is situated on the banks of the North Tyne. It is rectangular in shape, but with six gateways instead of the usual four. The Wall comes up to the eastern gateway and passes on from the western side of the camp. The gateways here still show ruts worn by chariot wheels and the tramp of feet passing to and fro; the heating chambers when opened out in 1843 still contained soot, and the bath was coated with red cement. The market-place, with its public buildings, the treasure-house and the Governor's residence, give the visitor plenty of material for his imagination to build upon (Fig. 2).

A hundred yards away is the river with the remains of the Roman bridge which spanned it at this point, and which Dr. Collingwood Bruce considered the most remarkable feature on the whole line of the wall (Fig. 3). In the museum are preserved numerous altars, inscribed stones, statuary, vases, gems, coins, rings, and so forth, which have been found during excavations on various parts of the Wall.

The camp at Housesteads (Borcovicus), five miles further on, contains a temple dedicated to Mithras, the Sun-God of Persia. About two miles to the south, at Chesterholm, a Roman milestone is to be seen still proudly standing upon the line of the Stanegate (Fig. 4).

The largest station is at Burdoswald, near Gilsland in Cumberland, on the main line between Newcastle and Carlisle.

FIG. 3.—Abutment of the Roman bridge at Chesters.

It is impossible in so short a space to do anything more than briefly mention some of the most interesting features of the Wall. The visitor must see something, no matter how little, to realize the magnitude and the grandeur of this work. An excursion is being arranged in connexion with the meeting, to visit Chesters and the Wall in the neighbourhood, and no one who is not already familiar with this vast monument of Roman greatness should miss the opportunity.

PLACES OF INTEREST IN THE NEIGHBOURHOOD.

Excursions are being arranged to visit some of the following places of interest in the neighbourhood of Newcastle-on-Tyne, all of which have taken a large share in the making of history in the "north countree."

Alnwick, the old county town of Northumberland and the seat of the Duke of Northumberland, lies thirty miles north of Newcastle: now a peaceful border town, but once a disastrous spot to the Kings of Scotland. The Abbey and the Castle contain much of interest. The bridge over the Alne with the Percy Lion with outstretched tail is a conspicuous feature not easily forgotten.

Morpeth, fourteen miles north of Newcastle, is a picturesque market town dating back to a remote period. The Castle, which was built shortly after the Conquest, stands on an eminence just above the main road leading into the town from the south. In the market place is the Town Hall and the Clock Tower, containing the bells of the town, on which the curfew is still rung nightly. About one mile to the west, on the banks of the Wansbeck, are the remains of Newminster Abbey, destroyed after the dissolution of the monasteries, and recently partially restored. Another mile in the same direction brings us to the remains of the Norman castle of Mitford.

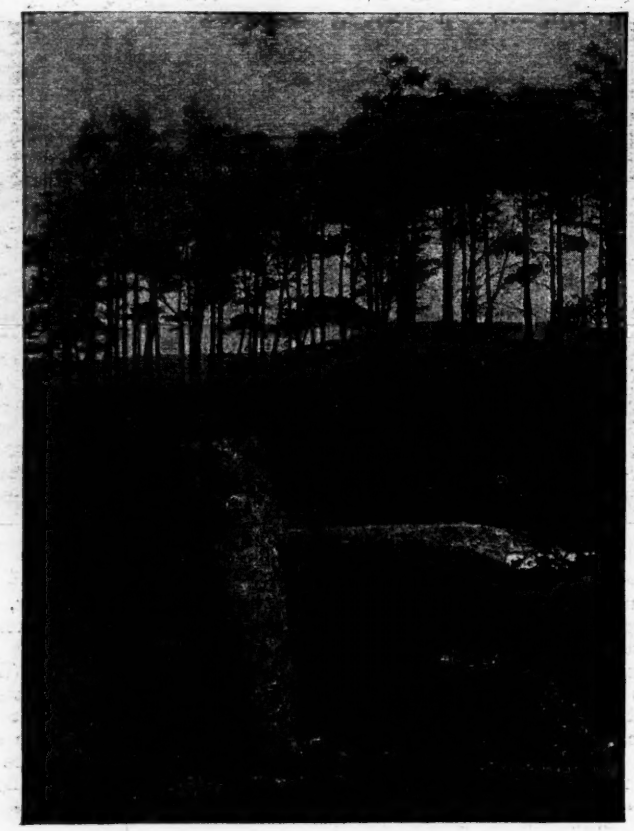

FIG. 4.—Roman milestone standing at Chesterholm.

Hexham, twenty miles west of Newcastle, is the centre of a district full of antiquarian interest. The town itself is of Roman origin and is situated on a terrace overlooking the valley of the Tyne. The beautiful old Abbey Church is said to form a veritable textbook of the Early English period of church architecture, and the Crypt, built of Roman stones, is of special interest. The Moot Hall and the Manor Office are two ancient buildings in the Market Place at Hexham.

Blanchland, about ten miles south of Hexham, figures much in Sir Walter Besant's historical novel of *Dorothy Forster*.

Tynemouth is situated on the north side of the mouth of the river, with its Castle and Priory forming prominent features. From here northward to Whitley Bay the cliffs are bold. This part of the coast is "Newcastle-by-the-Sea," and is within easy reach of the city by electric train. At South Shields, which stands on the south bank of the river opposite Tynemouth, is a Roman Camp.

Jarrow, on the south side of the river, midway between Newcastle and the sea, is famous apart from its industrial renown, for it is the home of the monastery in which the Venerable Bede, the head of the most famous school of learning in Europe, lived and laboured and died (673–735).

Durham is fourteen miles south of Newcastle, and is the capital town of County Durham. It is famous for its magnificent cathedral, unrivalled alike in situation and in architecture. The Castle is now the centre of the University, with its Colleges of Medicine and Science situated in Newcastle.

A Convocation is to be held at the University of Durham during the meeting of the British Medical Association, and members will have the opportunity of being present at the ceremony.

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England and Wales.

PAYING PATIENTS IN BRISTOL HOSPITALS.

AT the Royal Infirmary and General Hospital, Bristol, arrangements have been made for the admission of paying patients. After preliminary discussions, which lasted for more than a year, the committees and medical staffs of the two institutions agreed upon an identical scheme. This scheme was approved by the governors of each charity at general meetings held on May 25th and 26th. It provides that all in-patients able to do so shall pay up to 1 guinea a week towards the cost of their maintenance, that out-patients shall pay a small fee for each attendance, and that almoners shall be appointed at each institution. The rules of each charity, that such persons only shall be admissible as are unable to pay for medical advice and treatment, remain in force and have been reaffirmed. The following resolution was submitted by the honorary staff of the Royal Infirmary to the committee and governors:

> In order to enable the governors to bring into operation the proposals for the admission of paying patients, the honorary staff desire to offer their gratuitous services to all patients who are found after inquiry by the almoner to be unable to pay more than the cost of their maintenance. But in the case of patients whose payments are defrayed by public authorities or approved societies, the honorary staff will attend and treat such patients in consideration of an agreed percentage of the gross payment received by the Royal Infirmary being allocated to and paid into a fund which shall be administered by the honorary staff.

At the meeting of the governors of the Bristol General Hospital the honorary staff made verbally a similar offer of their services, excepting that they were not prepared to go so far as to attend gratuitously all patients who might be able to pay the whole cost of maintenance. The issue is not in itself of much moment; it is of considerable importance, however, to have a "contract of service" between hospital governors and staff so clearly defined with a view to present and future developments in hospital management and finance.

SCHOOL OF NURSING AT THE LEEDS INFIRMARY.

When the original part of the present infirmary buildings, with its five ward pavilions and its administrative pavilion, was opened in 1868 by King Edward VII, then Prince of Wales, it is said that the number of nurses employed at the infirmary was only 20, and the accommodation for even that small number appears from the plans to have been singularly inadequate. The original nurses' home was added in 1880 and was enlarged in 1885. The enlargement of the infirmary in 1892 necessitated further accommodation being secured, and the new nurses' home was opened in 1898. In 1907–8 it was again found necessary to increase the staff, and temporary but very satisfactory accommodation was secured by adapting some houses which had come into the possession of the infirmary in connexion with the purchase of the land for the King Edward Memorial Wing. The nurses now number about 170. Of late years a great deal has been done to systematize the training of the nurses, to widen their experience, and to

afford those who show special aptitude every facility for acquiring those branches of knowledge which are necessary for the proper carrying out of the duties of matron or superintendent. Candidates for training must be between the ages of 20 and 30; they are all appointed by the board on the recommendation of the lady superintendent, who interviews those who apply. They are admitted as pupil nurses for three months' trial, six to eight weeks of which are spent in the preliminary training school. During this period they receive lectures in elementary anatomy and physiology from the professors of these subjects at the university or from members of their staffs, and they also attend lectures on practical nursing and sick-room cookery. Before entering the wards they have to pass a satisfactory examination in the work they have done during this preliminary stage. In their preliminary training they are under the personal supervision of a special sister tutor and receive tutorial instruction from her. At the end of this period of special probation, if they are found to be satisfactory and likely to prove efficient nurses with training, they are, after a physical examination conducted by a member of the honorary staff, admitted to training in the hospital, and are required to remain in the service of the hospital for twelve months from the date of their beginning their preliminary training. If they desire to continue their training, and are approved, they then sign on for a further period of three years, so that at Leeds the training extends over a term of four years and no nurse now gets her certificate on a shorter curriculum. The institution of the preliminary term of training has proved a great success. It has shortened the time it takes to make a nurse of real use; it gently eliminates those who are not likely to make efficient nurses, and it lays the foundation for a more accurate and scientific acquaintance with the different departments of nursing.

During the hospital training lectures are given to first year's nurses on practical nursing and bandaging and on anatomy and physiology, to second and third years' nurses on surgery, medicine, and on ophthalmic and aural work, and during the third and fourth year on midwifery and gynaecology and on hygiene. The hospital certificate is awarded on the results of a terminal examination and on the report of the character of the nurse's work as evinced by term examinations and testified to by those under whom she has worked. Twenty scholarships providing free training for the certificate of the Midwives Board are given annually to selected nurses during their final year; class prizes are awarded also. During the fourth year the nurses receive the title of Staff Nurses, and from these promotions are made by the board, on the recommendation of the Lady Superintendent, to the position of "Sister" (15 Heads of Wards, Casualty and Out-patient Sister, and Theatre Sister). Four of the staff nurses are selected yearly to receive special training in housekeeping under the Lady Superintendent and her deputies. The training at Leeds is now believed to be of the highest standard. The comfort of the nursing staff has been the subject of sympathetic thought on the part of the board; the salaries have been increased, the time for recreation has been extended, and tennis courts have been provided by the kindness of the late Mr. Frank Gott, whose recent death is greatly regretted by his colleagues on the board as well as by everyone connected with the infirmary.

A further step will in all probability shortly be taken by which it is hoped that the University of Leeds will grant diplomas in nursing. The regulations are being very carefully drawn up and scrutinized, and it would not be right at present to say more than that both the University authorities and those who advanced the scheme in the first instance are keenly alive to the advisability of maintaining a high standard of general education and of technical training and knowledge. When the scheme is decided upon by the University the details will be given in this column.

County Maternity Home at Bishop Auckland.

The first County Maternity Home under the Durham County Council was opened recently at Bishop Auckland. Dr. Janet Campbell, chief maternity and child welfare medical officer at the Ministry of Health, was present, and congratulated the county on its excellent maternity and child welfare work. She said that there were still far too many maternal deaths from childbirth, and although death did not often result, many mothers were crippled in health for years afterwards through unskilled attention. There was a great need for small maternity homes of this type, and the Treasury had realized this, and had permitted the Ministry of Health to expend money on such beds when it refused grants for other schemes for maternity and child welfare. Councillor Barron, who was the recipient of a presentation in appreciation of his help in furnishing and equipping the home, referred especially to the fact that the preference in beds would be given to mothers whose home conditions were unsuitable for confinements and to those with complications in pregnancy, but, if beds were available, patients able to pay the full charge of three guineas a week would not be refused admission.

The County Maternity Home is to be managed by a joint committee consisting of members of the Maternity and Child Welfare Committee and of the County Nursing Association. The county medical officer acts as executive officer, and the senior welfare medical officer as advising medical officer of this committee. Any patient who so desires may be attended by her own doctor. Where no doctor has been engaged the matron will conduct the labours, but to ensure adequate medical attendance a rota of doctors resident in Bishop Auckland has been arranged; each will act for three months at a time, and if the acting doctor is not available the next on the list will be summoned. One of the welfare medical staff of the County Council will visit the home twice weekly and give the necessary lectures to the midwives when the home is approved as a training school. The home is a modern three-storied house, and it has accommodation for seventeen mothers and babies, and a resident nursing staff. Arrangements have been made for the training of midwife pupils, and already several patients have been admitted to the home.

Health of London.

The report of the medical officer of health to the London County Council for the year 1919 has just been issued. The general arrangement follows very much the lines of previous reports, and a document dealing with the concerns of over four million persons, and with the varied and various public health enterprises of the present day, cannot but contain many matters of profound interest not only to the hygienist but to the general public. The earlier pages are concerned with vital statistics, the incidence of infectious disease, and the public health administrative activities of the County Council. The chapter dealing with the school medical service is attractive because it recounts the gradual return to normal conditions of a vast public service which, during nearly five years, had been endeavouring to carry on its work with a largely reduced staff and with the public purse-strings gradually tightening. Included in the appendices is a detailed report by Dr. F. N. Kay Menzies, Principal Assistant Medical Officer in the Council's Public Health Department, on the arrangement for the treatment of tuberculosis in London, and a memorandum on the treatment of tuberculosis presented to the Insurance Committee for the County of London by their medical adviser, Dr. Noel D. Bardswell. We propose to make more extended reference to this report of Dr. Hamer in a later issue of the JOURNAL.

Medical Deputy-Lieutenants for Lancashire.

The following members of the medical profession have been appointed Deputy-Lieutenants for the County Palatine of Lancaster: Sir James Barr (Liverpool), Mr. Arthur H. Burgess (Manchester), Dr. Archibald Donald (Manchester), Dr. T. Wheeler Hart (Manchester), Dr. John Hay (Liverpool), Dr. C. Thurstan Holland (Liverpool), Sir Robert Jones (Liverpool), Dr. C. J. Macalister (Liverpool), Dr. G. R. Murray (Manchester), Mr. R. W. Murray (Liverpool), Dr. George Parker (Bolton), Dr. E. S. Reynolds (Manchester), Dr. Alexander Simpson (Warrington), Mr. J. W. Smith (Manchester), Sir William Thorburn (Manchester), Dr. C. J. Trimble (Penwortham, near Preston), Dr. John Utting (Liverpool). Mr. F. H. Westmacott (Manchester), Dr. Alexander Wilson (Manchester).

Ireland.

MEDICAL MEMBERS IN THE ULSTER PARLIAMENT.

THREE medical men have been returned as members of the Ulster Parliament; they are three of the four representatives of the Queen's University of Belfast; no medical men stood for any of the other constituencies. The voting for the university representatives stopped at 5 p.m. on May 28th, and at 8 p.m. the returning officer (the Vice-Chancellor) announced that the four successful candidates were Dr. John Campbell, F.R.C.S.Eng., Mr. R. J. Johnstone, F.R.C.S.Eng., Mr. John H. Robb, barrister, all of Belfast, and Dr. Hugh S. Morrison of Coleraine, co. Derry. There were three counts.

THE ULSTER MEDICAL SOCIETY.

The annual general meeting of the Ulster Medical Society was held in the Medical Institute, Belfast, on May 26th, with the President, Dr. Thomas Houston, in the chair. The council's reports were read by the secretary, the treasurer, and the librarian, and passed with slight amendments. The following office-bearers were elected for the ensuing session: President, Dr. Robert Hall, Belfast; vice-presidents, Mr. James C. Craig, Belfast, and Dr. G. L. St.George, Lisburn; council, Professor Lowry, Mr. Howard Stevenson, Dr. W. Burns, Dr. V. G. L. Fielden, Dr. S. B. Boyd Campbell, and Dr. Maitland Beath, all of Belfast; honorary treasurer, Dr. S. I. Turkington; honorary librarian, Dr. W. L. Storey; honorary secretary, Dr. W. W. D. Thomson; honorary editorial secretary, Dr. R. Marshall. A resolution of sympathy was passed with Dr. W. W. D. Thomson in his prolonged illness, and Dr. Marshall was thanked for his able discharge of the double duties. A prolonged discussion took place on the honorary treasurer's statement of accounts, as they showed a serious increase in the annual deficit, which had been small but increasing in past years; the general upkeep had been interfered with and some pressing repairs to the building were required by the trustees. It was finally agreed that a request, accompanied by a copy of the statement of accounts, be sent to all fellows and members, asking them to increase their subscriptions voluntarily by at least 50 per cent. for the ensuing year. Should this appeal fail, it would, it was thought, become necessary to raise the subscription to the society, though this would be done with great regret.

SIR PATRICK DUN'S HOSPITAL ROLL OF HONOUR.

Sir Patrick Dun's Hospital, Dublin, has cause to be proud of the honours which her old students won in the great war, for the 418 past and present students who served gained no fewer than 244 distinctions. The Roll of Honour, which contains the names of the old students and their distinctions, has just been published, and is accompanied by a photograph of the war memorial which was unveiled in the hospital last December, as was noted in our columns at the time. The memorial was erected at the exclusive cost of the survivors of the 418, and in addition a memorial bed was endowed in the hospital. On the memorial are the names of thirty old students who laid down their lives, including the following medical men:

Lieut.-Colonel Sir Charles B. Ball, Bt., Lieutenant W. O. W. Ball, Captain A. C. Bateman, M.C., Fleet Surgeon H. L. Geoghegan, Lieutenant H. R. Griffith, Colonel William Hallaran, Lieutenant F. G. Hopkins, Major P. G. Hyde, Captain Kingsmill W. Jones, D.S.O., Major J. T. McEntire, Légion d'Honneur, Captain E. J. McSwiney, Captain H. R. Robertson, Captain Edmond Robertson, Captain C. G. Sherlock, Major R. S. Smyth, Lieutenant George Taylor.

THE next meeting of the French Orthopaedic Society will take place this year on October 5th at Strasbourg, when discussions will be opened by MM. Froelich (of Nancy), Ombrédanne (of Paris), and Tavernier (of Lyons).

THE Ophthalmological Society of Vienna announces an extraordinary meeting to be held from August 4th to 6th. On the first day a discussion will take place on the success of the latest operation for glaucoma compared with the classical Von Graefe iridectomy, to be opened by Drs. Uhthoff and Wessely; other scientific meetings and demonstrations will be held on the following days. The secretary of the meeting is Dr. M. Lauber, Alserstrasse. Vienna VIII.

Correspondence.

THE FUTURE OF RESEARCH IN TROPICAL MEDICINE:

Facilities in Mauritius.

SIR,—Here in the island once known as "the Star and Key of the Indian Ocean," but now unfortunately possessing the unenviable notoriety of being the most unhealthy of British colonies, I read with much interest the account of Sir Leonard Rogers's address on the above subject in the JOURNAL of March 12th. He has unfortunately been misinformed as regards British East Africa, where, at Nairobi, a laboratory has existed for years, and where, long before the war, good work was done by Philip Ross, Harvey Pirrie and others. This laboratory, however, is poorly housed, and a new building is to be erected which will contain special rooms for research workers, apart from the accommodation provided for the staff.

Few, I think, who know the tropics but will agree wholeheartedly with Sir Leonard Rogers's arguments and plea for help. In Mauritius there is a case in point, though Mauritius is more fortunate than many places, for since August, 1907, it has had the benefit of an excellent little laboratory situated at Réduit. The building on the whole is well equipped, and is under the able direction of Dr. L. G. Barbeau, an old student of the London School of Tropical Medicine and of the Pasteur Institute, Paris. Unhappily he is hampered in his work, for he is understaffed and has to carry out many duties which should not fall to his lot. Furthermore, the laboratory is, unfortunately, situated far away from any large centre of clinical work. It is eight miles from Port Louis, the capital, where there is a big civil hospital, and it is a considerable distance from the new central hospital now in process of erection at Candos. The only hospital anywhere near it is that which serves the Moka district, and which chiefly admits surgical cases. This is certainly a drawback, but the disadvantage is to some extent minimized by the fact that the island possesses capital roads, and material can speedily reach the laboratory by motor car. Doubtless the present site was selected because Réduit is much cooler and healthier than Port Louis, but there can be no doubt that, for purposes of research at least, it would have been wiser to attach this laboratory to the civil hospital in the capital, where it could also have readily served the needs of the Port. Still, as it is intended to meet the requirements of the whole island in some respects, its position is suitable.

The history of the institution is interesting. It owes its origin largely to the energy of a well known Mauritian, Sir Henry Leclézio, K.C.M.G. He it was who induced a French army surgeon, Dr. Lafont, to leave Réunion and become the first director of the laboratory in Mauritius. Under Lafont the laboratory did good work, and indeed gained a measure of fame owing to the discovery by David, one of Lafont's assistants, of the flagellate of the Euphorbia, now known as *Leptomonas davidi*, a discovery which has had an important bearing on certain problems in protozoology. In 1911 Lafont left Mauritius, and Dr. Barbeau, in addition to other duties, supervised the work of the laboratory. In 1914 he was confirmed in the post of director. He has maintained the reputation of the laboratory, the services of which are in great request. As a result Dr. Barbeau and his few assistants are overwhelmed with routine work of all kinds, though praiseworthy attempts are made to conduct research, and though useful observations have been recorded it is wellnigh impossible at present to make much progress. Yet what a field of work is presented by Mauritius! The incidence of filariasis has never been ascertained; the actual mosquito vector of *Filaria bancrofti* remains unknown; despite serious efforts by Dr. Momple and Mr. Maya, the snail host of *Schistosomum haematobium*, the only human schistosome found here, has not been discovered.

There is a fine opening for entomological research in several directions, and it is possible that undifferentiated fevers exist. Surra occurs, but the fly which transmits *T. evansi* in Mauritius has not yet been determined.

A recent report by Dr. Kendrick, of the Rockefeller Foundation, has shown that ankylostomiasis is exceedingly prevalent. He estimates that no less than 226,000 persons

in the colony are infected, and in one district—that of Moka, in which the laboratory is situated—90.6 per cent. of the inhabitants harbour the helminth. Other worm infections are exceedingly common, and so, be it noted, is appendicitis.

From the hygienic point of view the resources of the laboratory could be utilized in many directions, and they must be so utilized if the island is to be made healthy. Much yet remains to be done as regards the incidence of malaria. Major Fowler's suggestion as to the necessity of further research into the rôle of *Anopheles mauritianus* as a carrier has never been acted upon. The precise value of the spleen index test requires to be determined, and the causes, apart from malaria, which induce splenomegaly should be the subject of careful inquiry. These are but a few of the questions which await the research worker here.

Mauritius is a good place for the pursuit of science. It is isolated, but there are few distractions. It possesses in some degree the peaceful atmosphere which is so favourable to research. It is small, the size of Surrey, and yet as full of problems and pathological conundrums as an egg is full of meat. Its leading medical men are well acquainted with the existing conditions, and would, I feel certain, welcome keen research workers from home. As is usual in these latter days, our good friends, the Americans, have been before us. What Dr. Kendrick thought of the sanitary condition of the island, and more especially of its capital, I can only imagine. Yet progress in sanitation must always be largely dependent on research in the laboratory. When are we going to wake up?—I am, etc.,

ANDREW BALFOUR.

Port Louis, Mauritius, April 30th.

THE TREATMENT OF ACUTE TOXAEMIA.

SIR,—The cells of many types of living beings, unicellular and multicellular, secrete poisons—endotoxins for defensive and exotoxins for offensive purposes. The microbes of disease, insects, snakes, and numerous plants furnish examples. All our vegetable medicines are endotoxins which, by means of poisonous action often combined with disagreeable taste, protect the producing plants from animal enemies. In chronic diseases—for example, tuberculosis and leprosy—the poisons are mainly endotoxins; in acute diseases—for example, measles, pneumonia, diphtheria, septicaemia—they are exotoxins. Fever is a reaction to toxaemia.

While experience of some poisons—for example, strychnine, quinine, and tuberculin—confers little or no added power of resistance, it is possible to train the individual to increased tolerance of other poisons—for example, nicotine, opium, snake and insect venom, and the toxins of the acute diseases. It is unnecessary to discuss the vexed question as to how this tolerance arises; bacteriologists have formulated many suppositions; but presumably it is in essence what biologists call "a use-acquirement," a product of functional activity, an habituation. The individual becomes "used" to, accustomed to, educated to toxins, and in recovery from acute disease his cells, no longer poisoned to impotence, are able, as a consequence, to attack and destroy the pathogenic organisms. Hence recovery and acquired immunity, temporary or permanent.

This habituation may be achieved in three distinct ways:

1. By beginning with small and proceeding to larger and larger doses of toxin, as in tobacco and opium smoking, and when diphtheria toxin is administered to a horse during the manufacture of antitoxin.
2. By beginning with and maintaining in action one large dose, as happens in acute disease which is followed by recovery.
3. By antitoxin and vaccine treatment, the rationale of which, as I say, need not be discussed.

The second method is exceedingly dangerous, and is the cause of death in disease. The last method has been attempted in many infections, but as yet it has been conspicuously successful in only a few acute diseases—for example, diphtheria and small-pox. Were it possible in acute illness to combine antitoxic serum with small doses of toxin, we should have an ideal method of cure. But serums for many acute diseases are lacking. Moreover, in illness the patient is already suffering from a large dose of toxin, which the introduction of small doses from outside would only make larger. Consequently, during illness, the only conceivable method of causing a sufferer to experience small doses is to reduce the amount of toxin in him. I do not know that this has ever been consciously attempted. I believe, however, it is not impracticable. In other words, I believe it is possible to abstract toxin from a sufferer.

Consider lobar pneumonia. A portion of the lung is invaded by the pathogenic organisms; blood is extravasated; and that portion of the lung becomes more or less solid. The temperature rises, rigors occur, the patient suffers from headache, sleeplessness, and a general feeling of illness. The severity of the disease is not at all strictly proportionate to the amount of lung involved, but depends rather on a toxaemia which especially affects the heart and breathing centres. In favourable cases a "crisis" occurs about the fifth to the tenth day. Commonly the patient sleeps, and awakes some time later feeling much improved. His temperature has fallen, his headache, rigors, and sleeplessness have gone, and he is bathed in sweat. Apparently the condition of his lung has not altered; but later gradual resolution occurs, and the extravasated and disintegrated blood is voided as "rusty" sputum.

Sweating is Nature's mode of cooling the healthy body by evaporation from the surface. But if, as usually happens in pneumonia, the patient is thickly covered with bedclothes and evaporation prevented, the temperature still falls. Presumably, therefore, something more than mere exudation and evaporation of fluid occurs in the crisis—something which in itself causes the fall of the temperature and the general improvement. I can conceive no reason for such a sudden change except a quick elimination of toxins, and, in view of the lack of evidence of increased activity in other possible channels of elimination, I cannot conceive by what road the toxins can be passed out if not by the sweat. I know of no evidence that toxins have been found in the sweat; but then, I do not know that they have been sought there.

Since recovery from acute diseases is associated with a falling temperature, moisture of the skin, and sleep, the administration of antipyretics, sudorifics, and soporifics was formerly common. But the medicines and the dosage generally employed depressed the heart and breathing centres, and of late it has been regarded as almost axiomatic that antipyretics and sudorifics are injurious under such conditions.

But if we give a patient, suffering from pneumonia, for example, and not already poisoned past redemption, the following dose, aspirin 10 grains, phenacetin 5 grains, and pulv. ipecac. co. 5 grains, we get (as far as my experience goes) what has all the appearance of an artificial crisis, without depression of the heart and breathing centres, or any other ill effects. The patient soon falls asleep, and wakes up some hours later feeling much better, bathed in sweat, his temperature down, his rigors and headache gone, and his pulse and breathing improved. The signs of illness will gradually return, but they can be abolished in the same way once or twice a day till permanent improvement sets in. On such occasions the patient will be relieved and rested, and, unless my experience has been unusual, his illness shortened.

Lately I myself fell ill of lobar pneumonia. I began the treatment I describe about the third day, having previously received ordinary treatment, but I know no good reason why I need have waited so long. My most vivid recollection is the immense and blessed sense of relief that followed each dose. I fell asleep within half an hour. After waking I was able for some hours to read or converse with comfort—indeed, with little feeling of illness. I suppose I took six or seven doses in all. Within a week I was writing at my desk. On the tenth day of illness I was taken for a thirty miles motor drive in the country. On the twelfth day I was walking about visiting friends at their own houses. On the thirteenth day I was back at full medical work, feeling none the worse. I am not young. I voided not rusty sputum but bright blood, showing rapid resolution. As well as I am able to judge, at each artificial crisis toxins were eliminated in large quantities, and the body was thus presented with several small doses, instead of having to make head against one continuously large dose. Certainly while my temperature was high I felt poisoned; during the intervals I felt, or seemed to feel, relief from poisoning. Apparently my sweat centre was roused to activity, while my heart and breathing centres were relieved by the elimination of the toxin.

I have never known ill results follow this treatment, though it has been tried lately in a fair number of cases, both by myself privately and by friends in hospital practice. The following is a fair sample of cases:

Lobar pneumonia (advanced stage). No improvement followed treatment. Death. Apparently the patient was poisoned beyond redemption.

Lobar pneumonia (early stage). The temperature was taken as a guide and several doses given. This case followed a course very similar to that in my own illness. Patient was up and about on the tenth day.

Bronchopneumonia following suicidal immersion. Only one dose was given. Sleep; sweating; temperature fell, and never rose again. Recovery, but "vast quantities of sputum were voided for four days."

Mild rheumatic fever. Some temporary relief followed each dose, but apparently no permanent improvement, though treatment was long continued. But aspirin has been found very useful in this disease. How does it act? Hardly as an antiseptic.

Diphtheria. Twenty thousand units of antitoxin given about the same time as the dose. Sleep; sweating. Patient awoke declaring himself recovered. Temperature never rose again. No further treatment necessary. Presumably, in this case the swift reaction to the antitoxin occurred because much of the toxin had been eliminated. That is, serum treatment was combined with a small dose of toxin.

Measles in child of 6. Beginning of eruptive stage. Severe photophobia; diarrhoea; cyanosis, so that mother remarked on "white appearance about the mouth." Temperature 103°. Dose (1/6 adult) given. Patient passed a good night. When seen next morning was sitting up playing happily in bed. Slight cough; rash fading. Temperature normal; no diarrhoea, cyanosis, or photophobia. Immediate recovery.

Two cases of measles; average severity. Doses given. One child much and the other little improved next day. Two more doses given. Both children nearly recovered that day.

Threatened breast abscess a week after childbirth. Temperature 101.5°; sleepless; acute headache. Bad mental condition. Dose given. Slept; sweated; awoke feeling much better in mind and body; temperature normal. Threat of abscess gone. No further treatment.

Diphtheria. Only one dose given, which apparently had no effect, good or bad.

Enteric fever. Only one dose given, which apparently had no effect.

Septic infection of ureter. Rigors; temperature 105°. Effect of doses as in my own illness. Quick uncomplicated recovery in a week.

Two cases of *pyrexia of uncertain origin.* One dose given. Sleep; sweating; recovery.

These are sample cases. Up to now the suggested treatment has apparently given such good results in many cases that I have hopes that it will prove generally usefu in the treatment of acute toxaemia—for example, in puerperal fever, surgical sepsis, tetanus, small-pox, and the like. But medicine is full of decaying mare's nests. It is never wise to trust to the experience furnished by a few cases to a few men. I venture, therefore, to ask if some of your readers, medical and surgical, will try this treatment, and either publish their results or inform me of them. Obviously, even if the treatment be useful in some acute diseases, it is sure not to be useful in others; the combination of drugs I suggest may be improved on; there may be a right and a wrong stage in each disease for the commencement of treatment, and so on.

I suggest that in every instance the trial shall begin by giving a single dose in a single suitable case. If the results are not unfavourable, the treatment may be continued and the experiment extended. My own experience has been such that I feel very confident. But that, I suppose, is the way of all beginners. It should be noted that I suggest an addition, not an alternative, to ordinary treatment. The extreme simplicity of the suggested addition is liable to create scepticism; and though simplicity does not always imply inefficiency, unfortunately it often does. However, the test and perhaps the improvement of this "reduction" treatment is easy.—I am, etc.,

Southsea, May 20th. G. ARCHDALL REID.

THE SITE OF OPERATION FOR EMPYEMA.

SIR,—Selection of the most suitable site for rib resection is not governed by definite rules, but depends on the situation of the collection of pus. For a general pyothorax or pyopneumothorax the authorities which I have consulted—British, French, and American—with one exception, prefer the eighth or ninth rib, just external to the angle of the scapula, with the arm horizontal—that is, at the most dependent attainable part of the cavity. Resection for encysted or localized empyemata should be—when x rays are not available—as near as possible to the mark of the lowest successful exploratory puncture. The technique of the operation and subsequent treatment are probably of more importance than the position of the incision, and a brief summary of the notes of 78 cases of pleural suppuration with resection under my care in France during 1917 and 1918 may be of interest.

Thirteen of these were unwounded, such empyemata as we meet in civil practice, and as, with one exception, the explorations or x-ray findings had indicated the ordinary site, this was chosen, and the results proved satisfactory, though in two cases it was found necessary to break down adhesions with the finger a couple of days later in order to set free loculated collections. The after-treatment differed from that described in the textbooks in that the lavage which they condemn was always employed, unless such complications as bronchial fistula or pulmonary abscess forbade.

My notes on the 65 resections for empyema or pyothorax following penetrating wounds of the chest confirm the good effects of irrigation especially by Carrel's method, but here a far more virulent infection was encountered. In many cases a sudden and extensive pneumothorax was the first indication of the presence of *Bacillus welchii* and immediate resection was the only course. A Turner's tube now and then relieved the extreme urgency, but in two only averted the need for a larger opening. The deaths, of which I have unfortunate record of twelve, were due to complications not likely to be met with outside military surgery, but the causes of three are of particular interest. The first of these was apparently doing well when seen in the morning, but in the afternoon developed a huge left pneumothorax from gas-bacillus infection, the heart being completely dislocated to the right side. Operation half an hour earlier *might* have saved the life.

Resection in the other two was soon followed by surgical emphysema, which rapidly spread from chin to hip, but ceased to increase on readjustment of the tube. This complication also happened in two non-fatal cases, and we were quite unable to explain how a positive pressure was set up sufficient to force air among the connective tissues. Such an accident might conceivably occur in civil practice.

So many of the remainder were similar to empyemata of non-traumatic origin that the knowledge acquired in their treatment may well be applied to our ordinary work. In the first place, the utility of x rays in localizing pus must be emphasized. Gregoire is very definite:

> "Exploratory puncture enables us to establish the existence of pus and the point where it is present, but it cannot tell us the limits of the collection. The surest way of ascertaining the site and lower limit of the cavity is incontestably puncture with a trocar guided by the radioscopic screen."

Secondly, I would like to record the excellent results that followed irrigation by Carrel's tubes. In localized collections the method of insertion is similar to that employed with deep septic wounds, but for a general pyopneumothorax the tubes are "armoured" with a silver stylet and their correct position ascertained by x rays. For the former three or four tubes are sufficient; for the latter as many as eight or nine may be required. The original intention was to reduce the infectivity of the pus to such a level as would permit of reclosure of the wound, and thus avoid extensive adhesions and promote early expansion of the lung. Frequent examinations of the number of organisms in a field were made, but only in two cases was the original aim attempted, and one of these had subsequently to be reopened. The ideal of Tuffier and Depage failed, but the early clearance of pus, the dissolution of purulent flakes, the ease to the patient, and the rapid general improvement were remarkable.

Thirdly, it must be remembered that cure is only complete when the lung returns to contact with the parietes, and every effort must be made to promote its expansion. Breathing exercises, whistling and playing wind instruments, are not willingly carried out by the resected nor cheerfully borne by their neighbours, but spiroscopic and suction methods of reducing intrapleural pressure should be employed wherever possible.

Fourthly, the benefit of open air and sunlight cannot be over-estimated.—I am, etc.,

Westcliff-on-Sea, May 23rd. T. B. SELLORS, M.D.

VITAMINS AND DENTAL CARIES.

SIR,—There are indications that the fat-soluble A theory of the causation of rickets is not satisfactory, and if the experiments of Professor Noël Paton and Mr. A. Watson (BRITISH MEDICAL JOURNAL, April 23rd) have not demolished this vitamin theory, they must at least have tempered the enthusiasm of its advocates. Naturally, Professor E. Mellanby (BRITISH MEDICAL JOURNAL, May 28th) does not abandon the theory, and even adopts the idea that lack of fat-soluble A in the diet is the "all-important factor" in the causation of dental caries! The contention that defective calcification of the teeth is responsible for the prevalence of dental caries is not new. It was, however, set aside by the dental profession years ago, after the late Professor G. V. Black's classic investigation into "the chemical and physical properties of the teeth" left no other course open. Having made an extensive chemical and physical examination of teeth, Black came to the conclusion that—

"the teeth of persons who suffer much from caries are just as hard, just as heavy, and contain just as much lime salts as the teeth of persons who do not suffer specially from caries."

In different teeth there are certain differences. Sir Charles Tomes gives the percentage of lime salts for the incisors as 71.5, and for the molars 73.2. These figures are practically the same as those recorded by Black, and more recently by Gasman. Yet, as is well known, the molar teeth are more frequently ravaged by caries than are the incisors. With regard to the microscopic structure of the teeth, Dr. Leon Williams showed years ago that—

"the finest lenses reveal not the slightest difference between enamel ground moist from a living tooth and that which has lain in the earth for a hundred centuries."

If fat-soluble A had anything to do with the prevalence of dental caries, why should we find that it increased with the increased consumption of such foods as butter, eggs, and animal foods. Together with an increasingly higher standard of living last century there was a corresponding increase of dental caries. Similarly, we learn from statistics that "the better the school the worse the teeth." On the other hand, during the war, when there was a notable scarcity of animal fats, milk, butter, and cream, what statistics we have indicate that there was a decrease in the prevalence of dental caries. There was, of course, a great reduction in the amount of sugar, sweets, etc., consumed, and the decrease in caries goes a considerable way to corroborate the "official" theory of the cause of the disease. I am not trying to indicate that meat, butter, and fats generally are harmful to the teeth; most dentists would agree that these foods are detergent in their effects, and had it not been for the shortage of these foods during the war the benefit of the restricted consumption of concentrated sugar (sweets, jam, etc.) would no doubt have been more conspicuous.

Consider the subject from another point of view. At the present day the temporary teeth of children are ravaged by caries, yet these teeth are calcified before the age when rickets is liable to supervene, and unlike the rachitic puppies under Professor Mellanby's care the temporary teeth of children, as a very general rule, take up a regular position in the jaws. Moreover, as a matter of fact, hypoplasia of the temporary teeth is most exceptional. In a recent investigation Mr. A. T. Pitts found only fifteen teeth showing hypoplasia in at least 4,000 cases. Yet caries of the temporary teeth is even more rampant than caries of the permanent teeth. Professor Mellanby may be disappointed in noting the conclusions which others draw from Professor Noël Paton's experiments on puppies, but his digression from rickets to dental caries does not appear likely to restore his fallen idol.—I am, etc.

London, W., May 28th. J. SIM WALLACE.

ECLIPSE BLINDNESS.

SIR,—Dr. Lodge and Dr. Maxted describe serious cases of eclipse blindness, in which there was no visible change in the fundus oculi, although the vision was much impaired. I saw two less serious examples of this distressing result of exposure of the retina to the solar rays, and it may be of interest to send a few observations I made regarding them.

The general features of these cases were: (1) the short time of exposure to the sun; (2) the presence of visible changes in the fundi; (3) a temporary central scotoma with diminished visual acuity; (4) complete recovery.

I will describe one of the cases more fully.

Miss E. T., aged 27, observed the eclipse on April 8th, 1921, for a few seconds only; she did not use any protective glass or other medium. On account of the photophobia she experienced, she at once desisted, but a little later noticed that vision was blurred. On the following day she attended the Birmingham and Midland Eye Hospital, complaining that since she had looked at the sun "things were blurred and she could not see the centres of things."

The visual acuity in each eye was 6/18, and the field of vision, normal with regard to its periphery, showed a small relative central scotoma. At each macula there was a yellow glistening line, which (magnified by the direct method of ophthalmoscopy) was about an eighth of an inch in length. There was also slight pigmentation around the maculae. The patient was prescribed potassium iodide and ordered to wear No. 3 smoked goggles for a time.

On April 23rd I examined the fundi again, but could find no sign of the changed appearance described above. On the occasion of each examination a mydriatic was used. On this day the vision was 6/6 in each eye. I saw the patient again on May 21st, and the visual acuity was unchanged and colour vision was normal. There was no central or paracentral scotoma, either relative or absolute, for white or coloured objects.

For permission to record the above case I am indebted to Mr. Fulford Eales.

With the suggestion that the public should be fully warned regarding the danger of observing eclipses without proper precautions I heartily agree. It seems remarkable that eclipse blindness occurs in such a small percentage of the interested observers.—I am, etc.,

H. W. ARCHER-HALL, D.O.Oxon.,
Assistant Surgeon, Birmingham and Midland Eye Hospital.

May 23rd.

THE PREVENTION OF PUERPERAL INFECTION.

SIR,—Once again the general practitioner is being subjected to a more or less well-deserved criticism in respect of his midwifery. Last year a somewhat heated controversy took place in your columns along similar lines, more particularly concerning the use of forceps in relation to the relief of pain. Towards the close of the discussion one correspondent went so far as to state that the "agony" of childbirth was a myth, and indirectly suggested the abolition of chloroform anaesthesia in labour.

In so far as the general practitioner is concerned, the fault lies at the door of the teaching schools, or, to be more precise, at the door of those responsible for the college curriculum. It is not that facilities are limited. They are not; on the contrary, they abound, but unless the student is particularly interested in obstetrics, he will not take advantage of them. He is not compelled to do so, as he is in the case of medicine and surgery. For some obscure reason, obstetrics—the oldest of the three arts—has not been permitted to share the same scientific standing as medicine and surgery. The subject has been neglected. It forms a very hurried, insignificant part of the student's final year, consisting of, at the most, six months' theory, followed by the personal management of twelve cases of normal labour in the district of a maternity hospital. The application of forceps or the attempted treatment of an abnormal case is strictly prohibited. So long as the regulations are complied with and a ticket is produced certifying that a course of lectures has been attended, and that twelve cases of labour have been undertaken, the authorities are presumably satisfied that that is all the experience required to practise obstetrics. The student is examined in theory, no clinical examination being considered necessary, and is then thrust upon a trusting public as a fully-qualified (*sic*) obstetrician.

In your issue of May 21st a correspondent makes the suggestion that midwifery should be a specialized subject, kept apart from general practice, and undertaken only by those to whom the work offers a special attraction. This would seem to be the ideal both to the practitioner who dislikes obstetrical work and to his patient. To those in general practice who specialize in obstetrics but dislike the remainder of their daily routine this suggestion, if materialized, would be a godsend; but, as your correspondent rightly says, the present scale of fees prohibits the occurrence of any such Utopia.—I am, etc.,

R. DOUGLAS HOWAT, L.R.C.P.and S.Ed.,
L.R.F.P.S.Glasg.

Hawick, May 23rd.

SIR,—Once again the subject of puerperal fever conveys heat to your correspondence columns, and I revel in it.

All are agreed on a few cold facts. Let me state them: The organisms responsible for puerperal fever are the *Streptococci pyogenes*, including those of erysipelas; the *Staphylococci aureus* and *albus*, also the organisms frequently associated with scarlet fever and diphtheria; pneumococci, gonococci, the organisms of typhoid and tetanus; and *Bacteria coli*. The last named has loomed large in recent years.

My figures, published in 1912, like those published by Matthews Duncan in 1876, prove that there is no connexion apparently between puerperal fever and erysipelas or scarlet fever. We may safely ignore pneumonia, typhoid and tetanus, and even gonorrhoea. We are left with the streptococci and staphylococci, and the *Bacteria coli*. If the *Bacteria coli* are responsible their source is not far to seek—namely, the mother. Personally I consider the case not proven. The streptococci and staphylococci may be traced to the mother, but again I am sceptical.

I claim to have been the first to suggest a reasonable explanation of the common source of those organisms—namely, where one would naturally look for them—that is to say, septic wounds. Now, how come they to reach the mother from septic wounds? Of course, if the mother is herself suffering from a septic wound, she infects herself; if not, they are conveyed to her by those attending her during parturition—that is, by the doctor or nurse, or both. Now, what is the common cause of septic wounds? I suggest industrial accidents are responsible for 95 per cent. To the question, How connect industrial wounds and puerperal fever? the answer is, by the individual who often treats both—that is, the medical practitioner.

I contend, without fear of contradiction, that this theory is the only one to explain the erratic and otherwise inexplicable incidence of puerperal fever.

To prove it I conceived the idea that if one classified districts according to the incidence of industrial accidents I would find the clue to explain the connexion between industrial accidents and puerperal sepsis. My book on the subject of which I still retain a few copies, and may be had for the cost of postage, proves my theory; I hold many letters from practitioners who agree with my conclusions, and I felt elated to fancy that Dr. W. Blair Bell referred to my statistics in his lecture published on May 14th.

I was not content, however, to rely on those figures only, and will give here a few others which further prove my contention. Notwithstanding the financial loss involved in my last attempt I propose again to publish a pamphlet on the subject, for like the man who found the goodly pearl I am prepared to sacrifice something to retain it.

There be few presumably who would claim any good to have come out of the great war, but even that calamity assists me in my fight for the truth. It occurred to me that there ought to be fewer accidents during the years 1915–18 (inclusive) than in normal times, so many men having to be withdrawn from industry, and if so that fact would be reflected in puerperal statistics. Unfortunately Government departments are unable to assist me in regard to accidents, but fortunately puerperal statistics for that period again prove my idea probable.

For the benefit of those still unfamiliar with my previous work—and I presume they are legion—let me briefly summarize a few chief figures and compare them with the succeeding ten years, including the war years. I have confined my present statistics to the administrative county of Lancaster.

Puerperal Rate per 1,000 Births in Classified Districts.

Lancashire Districts Classified.	(1) 1900-09.	(2) 1910-19.	(3) 1915-18 (War Years).
Mining districts	4.56	3.23	2.62
Manufacturing	3.2	2.80	2.35
Mixed	2.5	2.57	2.33
Residential	2.19	1.9	1.9
Rural	2.10	2.69	3.39

Note (1) the varying incidence and the decreasing rates from above downwards in columns 1 and 2; (2) the lower rate in column 3 for the upper three districts; (3) the fixed rate in column 3 for residential districts; (4) the increased rate in column 3 for rural districts; and observe that the three upper districts are those likely to be affected by withdrawal of industrial workers, and hence to experience a decrease of industrial accidents.

Further, is it a coincidence that I can prove the attack rate per 1,000 births was 2.35 in the period 1915–18, and 3.08 in the previous five years? Or, again, that a four months' strike in the cotton trade in 1910 coincided with a puerperal rate for that year lower than for any year since the Midwives Act—a fact which induced undue optimism in the mind of the M.O.H. for Lancashire, rudely shattered by the statistics of the succeeding four years.

Can any of your readers suggest any other explanation of these facts?

I may be puffed up by statistics, but am prepared to be let down by reason. I must refrain from answering Dr. C. M. Stevenson at length, and also from wearying your readers by statistics showing the relative responsibility of doctors and midwives.—I am, etc.,

Heywood, Lancs., May 21st. GEORGE GEDDES.

SIR,—Dr. Vaughan Pendred speaks of an experience of twenty-seven years. Alas! I can quote a longer one. Time has taught me the value of gloves and a sterile jacket. The former are more readily washed in soap and water or soaked in perchloride if by chance the hands have touched any unclean thing of the patient or surroundings.

Mercury biniodide roughens the hands and in time renders them difficult to maintain clean; in the winter antiseptics are often self-destroying.

I would say soap and water, boiled rubber gloves and a sterile jacket, the avoidance of lubricants and "meddlesome midwifery," including the odd examinations by maternity nurses, will not introduce sepsis, and if not introduced it will not want dealing with by strong antiseptics.

Much of my work is major and minor surgery; I carry out in midwifery practice the technique so far as possible of the operating table.

Antiseptics are a snare to the careless; the use of soap and water and sterile rubber gloves are a definite double event which can only do good if merely by shutting off our finger nails.

In the individual case the causation of puerperal infection may be within or without the patient.—I am, etc.,

Dorchester, May 29th. W. B. COSENS.

REFRACTION WORK IN CHILDREN,

SIR,—Any Education Committee which expects its medical officer to complete six cases in an hour must also expect to have the work scamped and unsatisfactory results exhibited; on the other hand, somewhat more than three cases done with care and accuracy must be expected at the hands of every refractionist. I have been engaged in this work for a period extending over seventeen years and comprising such a number of cases as has passed into thousands, and am able to say that nine cases in a session of two hours is an average and that subjective methods must be combined with retinoscopy—in fact, where any reliance can be placed upon the information obtained from the subject, the subject must have the last word. In many clinics where too much work is demanded, and only objective methods are practised, a large number of the children in various ways express discomfort; especially is this so among hyperopes where over-correction almost appears to be the rule; such children return again and again for re-examination, so that while the number of attendances is a maximum the number of cases satisfactorily disposed of is a minimum; or many such children seek the assistance of opticians who, founding their subjective test upon a measurement of the glasses in question, are often, very often, able to remove that discomfort which ought never to have existed. In the case of very young children and those of defective mental capacity or interpretation, only objective methods can be practised, but surely these should be the exception and not the rule.—I am, etc.,

London, W., May 30th. H. G. CRITCHLEY, M.D., D.P.H.

DEFECTS IN TUBERCULOSIS ADMINISTRATION.

SIR,—Your leading article (BRITISH MEDICAL JOURNAL, May 7th, 1921, p. 678) on the new tuberculosis regulations brings into prominence one of the great defects in the organization of the public health service—namely, the haphazard division of work between the county medical officer of health and the medical officer of health for a district within the county. Assuming for the moment that both kinds of health officers are necessary, surely the work should be so apportioned that each has a definite and appropriate share and the natural division is local work for the local man, provincial work for the provincial man.

Let us see how far this applies to the tuberculosis scheme. In the first instance, the general practitioner is required to notify every fresh case of tuberculosis coming to his knowledge to the medical officer of health for the district where the patient resides. It is the duty of that medical officer to see that notification is duly carried out, to keep trace of the patient as he moves within or out of the district, or enters or leaves an institution, or dies; but, apart from attending to any insanitary conditions which may affect the patient or the spread of infection, the local medical officer of health has no further concern with the case, nor is he in a position to render any effective service. The formal information which he has collected is passed on in a weekly return to the county medical officer of health, who in turn directs the work of the tuberculosis officer (and nurse) under whose supervision the patient remains. There is, unfortunately, no reciprocity between the tuberculosis officer who looks after the person of the patient and the local medical officer of health who looks after his surroundings.

Clearly all local work comprised in the term "domiciliary treatment" should be done under the eye of the local medical officer of health, and the sanatorium treatment, which rests on a larger basis, would be properly left entirely in the hands of the county medical officer, while the position of the tuberculosis officer between the two might be roughly compared to that of a liaison officer. One can hardly imagine a more inconvenient and uneconomical arrangement than that which at present exists in regard to bringing tuberculosis officer and patient into contact, for the earliest the former can hear of a new case is through the local medical officer of health and the county medical officer of health, after a delay of any time up to a week! On the other hand, neither the tuberculosis officer nor the county medical officer can deal with the patient's environment—for example, overcrowding, defective sanitation, etc., except through the local medical officer of health. For all local matters at least no great harm would result if the county medical officer of health were cut out of the circuit, and the way by which this could be effected was clearly indicated in the Regulations of 1912, referred to in your leader.

The inconsistency, so apparent in this rough and ready division of work, leads to a great deal of confusion and, naturally, at times, to no small amount of friction between county and district medical officers of health. The remedy would not be difficult to find if those who have actual experience of the work and its peculiar problems were consulted, while, by a revision and consolidation of the numerous scrappy Orders and Regulations now in existence, the whole matter could be quickly settled.—I am, etc.,

May 16th. MIXTURE.

THE first of a series of three new buildings for the University of Manitoba is nearly completed, and will provide accommodation for the departments of biochemistry, bacteriology, and physiology, with provision for laboratories, lecture rooms, museums, and departmental libraries.

THE records of the New York Health Department show that for the first fourteen weeks of 1921 the infant mortality rate was 80 per 1,000 children born, as against 112 for the corresponding period of last year. In commenting upon this reduction, which represents a saving of 1,132 infant lives, the Health Department suggests the possibility that the mild winter, which resulted in better ventilation of premises and in children being out of doors a greater part of the time, may have been a factor, and also that better food, better clothing, and the more general dissemination of information in regard to hygiene may be responsible.

Obituary.

RICHARD EUGENE HARCOURT, M.D., F.R.C.S.,

Ophthalmic Surgeon, Bootle Borough Hospital.

DR. HARCOURT, who died at his residence in Oakfield Park, Liverpool, on May 19th, was born in 1858 at New Jersey, U.S.A. His father was a native of County Down, Ireland, and his mother an American lady of Dutch extraction. Harcourt spent his school life partly at Newry and partly at the Liverpool Institute. He received his medical education at Queen's College, Belfast, and graduated in 1887. He remained a keen student all his life, as is shown by the post-graduate degrees which he acquired—the M.D. and B.A.O. of the Royal University of Ireland in 1893, the M.D., M.S. Uruguay in 1893, and finally the F.R.C.S. England in 1907. After a period of service under Mr. (now Sir) Robert Jones at the Royal Southern Hospital and at one of the Manchester Ship Canal hospitals, Harcourt went to Buenos Aires, where he practised for ten years and was medical officer to the Buenos Aires port works and to the Government police at Las Conchillas. He returned to England in 1898, and after a short spell of practice at Warrington settled down in Wavertree, Liverpool. He retired from general practice about ten years ago and devoted himself to ophthalmology, being appointed pathologist to the Liverpool Eye and Ear Infirmary; later he became also assistant surgeon to this hospital and ophthalmic surgeon to the Bootle Borough Hospital and assistant ophthalmic surgeon to the St. Helens Hospital. His excellent pathological work secured for him a lectureship in ophthalmic pathology at the University of Liverpool. During the war he gave invaluable assistance to the depleted staff of the St. Paul's Eye Hospital. To all this work and to an increasing private ophthalmic practice Dr. Harcourt added a large amount of ophthalmic school work for the Bootle and Liverpool education authorities, industrial schools, and for the Roman Catholic school committees.

There can be but little doubt that overwork was one of the contributory causes of his last illness. He had suffered from dysentery while abroad, and recurrences of this trouble were not infrequent. About a year ago he became anaemic, and this affection turned out to be of the "pernicious" type; transfusion (thrice repeated) and all the remedies that the physician and bacteriologist could devise were applied without avail. During a temporary improvement in his health last autumn Harcourt returned to full work, to which he clung pathetically, only to be forced to relinquish reluctantly duty after duty.

With the exception of reading and his social and family duties Harcourt's relaxation consisted simply of change of work. Though he began to specialize as an ophthalmic surgeon late in life, he was a good operator, and his wide reading and full knowledge of general surgery and pathology made him a thoroughly sound practitioner and a successful and inspiring teacher. Dr. Harcourt was a member of the Liverpool Medical Institution, where he frequently showed patients and pathological specimens, was one of the original members of the North of England Ophthalmological Society, and a member of the British Medical Association. He was an ardent Freemason and an active supporter of the Wesleyan Church.

As a man and colleague Harcourt was genial, kind and loyal, ever young and progressive; if he had a fault it was that he spoilt his colleagues by his good-natured readiness to help them when they were lazy or tired, ill, or overworked. Dr. Harcourt is survived by his wife, two sons, and three daughters.

DR. ARTHUR SNEYD TAYLOR, of Surbiton, who died on April 7th after two days' illness, was born in 1859 and educated at Merchant Taylors' School, where he won a mathematical scholarship and proceeded to Pembroke College, Cambridge. He graduated B.A. in the mathematical tripos in 1882. He then entered Guy's Hospital and took the diploma of M.R.C.S. in 1886 and the Fellowship two years later, and graduated M.B., B.Ch.Camb. in 1887 and M.D. in 1893. He was surgeon to the Surbiton Cottage Hospital. Dr. Taylor was a noted Rugby footballer. He represented Cambridge, Guy's, and Blackheath in the eighties; played for the South against the North and for England against Wales in 1882. He played again

for England in 1883 and in 1885–86. During the war he was temporary Captain, R.A.M.C.(V.), and took an active part in the work of the Kingston-Surbiton District Red Cross Hospital and of the Oakenshaw War Hospital. On his retirement in March, 1920, he was granted the honorary rank of captain. He was a member of the Kingston Division of the British Medical Association.

Universities and Colleges.

UNIVERSITY OF LONDON.

THE following candidates have been approved at the examination indicated:

THIRD M.B., B.S.—*‡§C. H. Andrewes (University Medal), †Florence R. Clulow, ‡H. A. Harris, §R. C. B. Ledlie, *A. G. Maitland-Jones, ‡V. E. Negus, *P. Steinberg, Doris E. Alcock, G. C. Agarwala, W. M. Anthony, J. R. Banks, Mary R. Barkas, F. M. Barnes, H. E. Beasley, Ursula P. Blackwell, H. J. Blampied, J. Brodie, P. C. P. Cloake, E. V. Corry, Elsie E. Cowperthwaite, Ll. ap I. Davies, A. G. Duncan, Edith M. Evans, Ada M. Freeman, I. Frost, Madeline Giles, F. Heber, J. G. Jones, Dorothy M. Kemp, Mary K. F. Lander, E. H. L. Leclezio, H. W. Lewis, R. T. Lewis, Margaret Longbottom, E. R. Lovell, G. J. W. McMichael, Henrietta A. C. Main, C. H. Marshall, Adeline M. Matland, Kathleen H. Matthews, Sybil M. Nuttall, Sybil G. Overton, R. H. Parry, Phoebe M. Phillips, Alice D. Pocock, W. R. Rowlands, G. W. R. Rudkin, H. L. Sackett, A. Shafeek, B. B. Sharp, Katherine J. Shaw, L. F. Strugnell, R. N. L. Symes, R. S. Tirodkar, Norah E. Trouton, A. E. Ward, S. A. T. Ware, R. W. Warrick, F. W. A. Watt, Agnes E. Westwood, I. G. Williams, W. P. Wippell, W. C. S. Wood.

Distinguished in * Medicine, † Pathology, ‡ Forensic Medicine, § Surgery.

UNIVERSITY OF BRISTOL.

THE University Council at its meeting on May 27th received the resignation of the Vice-Chancellor, Sir Isambard Owen, M.D., who, having reached the age of 70, is due to retire under the operation of the Treasury new rules with regard to superannuation. The resignation takes effect at the end of the present session. Sir Isambard Owen, who went to Bristol in 1909 in succession to Professor Lloyd Morgan, is responsible for practically the whole of the organization of the University.

SOCIETY OF APOTHECARIES OF LONDON.

THE following candidates have passed in the subjects indicated:

SURGERY.—*†E. D. Fenwick, *H. L. Sheehan, *†J. Solomonoff.
MEDICINE.—†F. E. Edwards, *†M. A. K. El. Hennawy, *†E. D. Fenwick, *†O. E. Finch, *A. Mishriky, *H. L. Sheehan.
FORENSIC MEDICINE.—F. E. Edwards, M. A. K. El. Hennawy, E. D. Fenwick, O. E. Finch, H. L. Sheehan, M. Tcherny, R. E. Williams.
MIDWIFERY.—M. A. K. El. Hennawy, E. D. Fenwick, M. Fox, A. Senn, H. L. Sheehan.

*Section I. †Section II.

The diploma of the Society has been granted to Messrs. E. D. Fenwick and J. Solomonoff.

The Services.

DEATHS IN THE SERVICES.

SURGEON-MAJOR HENRY COOKSON, Bengal Medical Service (retired), died at Cheltenham on April 22nd, aged 88. He was born on February 10th, 1833, the son of Mr. Thomas Henry Cookson of Boston, and was educated at Edinburgh University, Leeds, and St. Thomas's Hospital. He took the M.R.C.S. in 1856, and entered the Royal Navy as assistant surgeon in the same year, but resigned with less than three years' service. In 1859 he took the L.R.C.P.Edin., and entered the I.M.S. on January 20th, 1860, attaining the rank of surgeon-major on July 1st, 1873, and retiring on May 20th, 1880. He also took the F.R.C.S.Eng. in 1870, and the D.P.H., after retirement, in 1882. He served on the North-West Frontier of India in the Jowaki campaign of 1877–78, when he was mentioned in dispatches, in G.G.O. No. 738 of 1878, and received the frontier medal; and in the second Afghan war of 1878–79, when he took part in the capture of Ali Musjid, was again mentioned in dispatches, in G.O.C.C. of October 14th, 1879, and received the medal with a clasp.

Fleet Surgeon Anthony Kidd, R.N. (retired), died on April 24th at Bath. He was educated at the Ledwich School, Dublin, and took the L.R.C.S.I. in 1879 and the L.K.Q.C.P. in 1880; he entered the navy and attained the rank of fleet surgeon on February 26th, 1897. Before his retirement he was serving as principal medical officer at Pembroke Dock, and afterwards filled the post of surgeon and agent at Falmouth; subsequently he practised at Bath.

Lieut.-General Sir Launcelotte Gubbins, K.C.B., formerly Director-General A.M.S., has been reappointed a Special Commissioner of the Royal Hospital, Chelsea.

Medical News.

THE following committee has been appointed by the Minister of Pensions to inquire into the management by the Ministry of Pensions and the Joint Disablement Committee for the South-West of Scotland, of Bellahouston Hospital, and especially the organization of the out-patient department: The Right Hon. Lord Scott Dickson, P.C., K.C. (chairman), Sir Donald MacAlister, K.C.B., president of the General Medical Council, Mr. W. Grieve, a disabled soldier, and Colonel Sir Arthur L. A. Webb, K.B.E., C.B., Director-General of Medical Services, Ministry of Pensions.

THE annual dinner of the Indian Medical Service will be held at the Trocadero on Wednesday, June 15th, Major-General Sir R. Havelock Charles, G.C.V.O., in the chair. Tickets and all particulars may be obtained from the joint honorary secretary, Colonel J. J. Pratt, I.M.S.(ret.), 63, Addison Road, Kensington, W.14.

THE Cavendish lecture, followed by the annual conversazione of the West London Medico-Chirurgical Society, will be delivered at the Kensington Town Hall by the Right Hon. Christopher Addison, M.D., M.P., on Friday, June 17th, at 8.15 p.m. The subject of the lecture will be "The part of the State in the prevention of disease." A reception will be held at 7.45 p.m. Members requiring tickets for guests are asked to communicate as early as possible with the Hon. Secretary, Dr. D. G. Rice-Oxley, M.C., 22, Victoria Road, W.8.

COMMEMORATION DAY took place on May 27th at Livingstone College, London, E., when many friends of foreign missions were present at a gathering presided over by Sir George Makins, who said that it was necessary that the missionary, to fulfil his aim, should have, in addition to his theological training, some knowledge of medical things. He remarked on the great value in the mission field of the partial medical training which was obtained at Livingstone College. The value of this training was further emphasized by the personal experiences related by Dr. G. E. King, of the China Inland Mission, and the Rev. L. Taylor of the Moravian Mission, Nicaragua.

A SESSIONAL meeting of the Royal Sanitary Institute will be held on June 9th and 10th, in the Guildhall, Gloucester, jointly with the West of England Branch of the Society of Medical Officers of Health. On June 9th at 10 a.m. a discussion on "Public health development in Gloucestershire" will be opened by Dr. J. Middleton Martin, County M.O.H. Gloucestershire. On June 10th, at 10 a.m., there will be a discussion on "The collection and disposal of house refuse." The chair will be taken by Professor H. R. Kenwood.

THE annual general meeting of the Governors of Epsom College will be held at the offices, 49, Bedford Square, W.C.1, on Friday, June 24th, at 4 p.m.

ON May 14th the 125th anniversary of the first vaccination performed by Edward Jenner was celebrated in the hall of Leyden University by the Dutch Society for the History of Medicine and Natural Philosophy. Addresses were given by Professor E. C. Van Leersum and Mr. C. J. S. Thompson, Curator of the Wellcome Museum.

A QUESTION was recently addressed in the House of Commons by Mr. Robert Young, M.P., to the President of the Board of Education on the subject of whether the earlier hours of attendance and the consequently prolonged day due to the operation of the Daylight Saving Act had had any injurious effect on the health of young children. A circular has been sent to local education authorities by the medical department of the Board of Education asking than an endeavour should be made to ascertain through school medical officers and teachers the effect during the current year of the Summer Time Act on the health of school children, and on their proper attention to school work.

A MEDICAL congress will be held at Helsingfors from June 30th to July 2nd. The principal subject to be discussed is the treatment of syphilis—(*a*) of the central nervous system, and (*b*) of the thoracic and abdominal viscera.

THE next course of international post-graduate lectures in Vienna will begin on June 6th. Full particulars can be obtained from the Dean of the Medical Faculty at the University, Franzensring, Vienna 1. The course will consist of lectures, by professors of the Medical Faculty, on recent advances in surgery, orthopaedics, gynaecology, and pediatrics.

THE annual meeting of the British Science Guild will be held at the Goldsmiths' Hall, Foster Lane, London, on Wednesday next, June 8th, at 3 p.m., when Dean Inge will speak on "The road to ruin and the way out," and Sir Richard Redmayne will give an address on the importance of research in promoting the development of mineral industries.

THE annual dinner of the Harveian Society of London will be held at the Café Royal, Regent Street, on Wednesday, June 22nd, at 7.30 p.m.

ON the occasion of the departure of Dr. D. A. Powell from the district to become superintendent of the Welsh Sanatorium at Denbigh, the medical practitioners of Anglesey entertained him to a very successful dinner, held on May 13th, as a mark of esteem and of the cordial relations that had existed between Dr. Powell, as tuberculosis physician to the Welsh National Memorial, and the practitioners of the district.

THE second annual general meeting of the Society for the Prevention of Venereal Disease will be held at 5.30 p.m. on Monday, June 6th, at the Barnes Hall, 1, Wimpole Street (kindly lent by the Royal Society of Medicine).

As already announced, the annual provincial meeting of the Society of Medical Officers of Health will be held on Saturday, June 11th. Owing to a printer's error in the notice sent to members, we are asked again to draw attention to the date.

THE June number of the New York *Medical Review of Reviews* will be a special radium number dedicated to Madame Curie, and will consist exclusively of articles on radium and its uses by the most prominent radiologists in the United States and Canada.

THE fifty-second annual meeting of the Canadian Medical Association is announced to take place at Halifax, Nova Scotia, from July 5th to 8th, under the presidency of Dr. Murdoch Chisholm.

As a step in the reconstruction plans of Yale University the subjects of pharmacology and experimental medicine have been combined into a university department with the title of the Department of Pharmacology and Toxicology. Special attention is to be devoted to the training of future investigators and teachers, and to the chemistry and physiology of the action of drugs and poisons.

ACCORDING to the *Journal of the American Medical Association*, an unusual situation has been brought about in the Johns Hopkins Medical School and the Johns Hopkins Hospital by the resignation of Dr. William S. Thayer, professor of medicine in the medical school and physician-in-chief of the hospital, who was chief medical adviser of the American Expeditionary Force during the war. The seventy physicians connected with the department of clinical medicine have offered their resignations in response to a circular letter sent out by the medical board of the hospital. This letter explained that none of the members of the department would be reappointed prior to the selection of the successor to Dr. Thayer. This course was taken in order that the new professor of medicine and physician-in-chief of the hospital might have a free hand in reorganizing his department and carrying out the policy involved in the idea of a full-time professorship.

IN addition to the post-graduate courses in medicine at the Hôtel-Dieu already noted in the JOURNAL, a number of other vacation courses will be given in Paris during this summer and autumn. At the Hôtel-Dieu, from July 1st to 31st, there will be a course on diseases of the digestive tract and the biliary ducts, by Professor Hartmann and others, and at the Salpétrière Hospital, from June 27th to July 11th, a post-graduate course on surgical technique, including practical work, by Professor Gosset, assisted by Dr. G. Loewy and others; this latter course will be conducted in English, and will be limited to twenty medical men. At the Hôpital de la Pitié, from June 20th to July 10th, a course on diseases of the heart, blood-vessels, and blood will be given by Professor Vaquez and others, and at the Hôpital des Enfantes Malades, from August 17th to September 3rd, a course on diseases of children has been arranged by Professor Nobécourt. At the Broca Hospital, from September 19th to October 1st, a course on gynaecology will be given by Professor J. L. Faure and his colleagues. In the histological laboratory of the faculty of medicine there will be during the month of October a course on histology, by Professor Prenant, and in the pathological laboratory, from October 5th to 30th, a course on pathology by Professor Letulle. At the Hôpital Laënnec and other three hospitals in conjunction, from July 4th to 17th, a course on tuberculosis will be carried on by Professors Léon Bernard, Bezançon, Auguste Broca, Letulle, and Renon, and in the laboratory of the faculty, from July 1st to 12th, a course on parasitology will be given by Professor Brumpt. At the School of Child Welfare, 64, Rue Desnouettes, Paris (XV^e), from October 3rd to 13th, a series of lectures on child welfare, with visits to the Parisian municipal centres, has been arranged by Professor A. Pinard and others; further information on this course may be obtained, before September 25th, from M. Weisweiller, administrator of the school. In regard to all the other courses particulars will be given by the Secretary of the Faculty of Medicine of Paris, to whom application should be made, before June 15th, in the case of courses before the month of August, and before July 15th, in the later courses. The fees range from 50 francs, for the child welfare course, to 80 francs for the courses on histology and pathology, and 150 francs for the clinical courses. Information regarding such matters as travel and accommodation will be given by the Association for the Development of Medical Relations, at the Faculty of Medicine of Paris.

THE University College Hospital Ladies' Association, founded some twenty years ago to provide clothes for patients in the wards and to help patients when discharged, has now some eight hundred members and ten local branches; it maintains two beds and its junior branch a cot. Its latest work has been the establishment of an infant welfare department. The hospital is in financial difficulties, and the Ladies' Association will hold a sale on June 8th at Somerles House, Regent's Park, the residence of Major Harold and Lady Zia Wernher. The sale will be opened by Princess Helena Victoria at 11.30 a.m.

SIR KENNETH W. GOADBY, K.B.E., M.R.C.S., lecturer on bacteriology at the National Dental Hospital, has been appointed to represent medical science on the Advisory Committee for the Metalliferous Mining Industry.

MESSRS. A. W. GAMAGE, of Holborn, E.C.1, have issued a new catalogue containing particulars, with prices, of a very large number of motor accessories.

Letters, Notes, and Answers.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London*; telephone, 2630, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London*; telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Medisecra, Westrand, London*; telephone, 2630, Gerrard.

The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin*: telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate Edinburgh*; telephone, 4361, Central).

QUERIES AND ANSWERS.

DIACETIC ACID TESTS.

"F. E." (Orange Free State) writes: I should be glad to know of a method of detecting diacetic acid in the stains of a baby's napkin. I find that lint damped with normal urine to which diacetic acid has been added does not give the purple reaction with ferric chloride solution as one would expect.

*** Diacetic acid (and acetone), being volatile substances, cannot be detected by any test in a stain on a napkin. The only way would be to test the fresh expressed urine with the nitro-prusside test (this is best done as a ring test), which shows both acetone and diacetic acid. The blood can also be examined for acetone, and the carbon dioxide content of the alveolar air determined to show acidosis.

INCOME TAX.

"T. G." bought out his senior partner on January 1st, 1920. He asks whether he can deduct as an expense in calculating his income tax return that portion of the gross receipts which

is handed over to the retired partner as being his share of fees earned prior to the dissolution.

*** No; our correspondent is now liable to payment of tax on the whole of the practice profits. Strictly he is entitled to base his gross receipts on bookings, but if he prefers to take the cash takings basis, then all the takings which relate to the practice must be brought into the computation.

"S. B." inquires as to the proper basis of assessment in view of the fact that he purchased a practice on January 1st, 1920.

*** For 1920-21 "S. B." is chargeable on the amount of the average profits of the practice over the three years to December 31st, 1919, and for 1921-22 on the three years' average to December 31st, 1920. In each case the average is reducible to the profit of the current calendar year if a specific cause for the reduction can be shown. Presumably the advice of the local inspector was given on the assumption that "S. B." was not in a position to ascertain his predecessors' profits for the purpose of average. In calculating the "profits" for the early years of his own work, "S. B." must take into account fees receivable but not actually to hand.

"L. T.'s" car transactions have been as follows:

	£	s.	d.
1910. Secondhand Allday bought for ...	100	0	0
1911. Secondhand Allday sold for ...	50	0	0
New De Dion bought for... ...	289	0	0
1913. New Ford bought for	138	0	0
1919. De Dion sold for	25	0	0
1920. Ford sold for	57	10	0
Secondhand Ford bought for ...	230	0	0

*** Our correspondent can claim the cost of renewing his Ford car (£230−£57 10s.=£172 10s.) as an expense. Further, if he again buys a secondhand car and maintains it at the same time as the Ford, he can bring in as an expense the loss on the De Dion—that is, £289−£25=£264.

PARATYPHOID FEVER.

"F. Z. O."—The references to paratyphoid fever are scattered, and consist, for the most part, of short articles in medical journals. *Typhoid Fevers and Paratyphoid Fevers*, by Vincent and Muratet, one of the series of French military medical manuals, has been translated by Dr. J. D. Rolleston (University of London Press. 1917. Price 7s. 6d.). Dr. Charles Miller's Goulstonian Lectures in 1917 were on paratyphoid infections. An earlier account of the clinical features of paratyphoid fever was given by Torrens and Whittington in the BRITISH MEDICAL JOURNAL of November 13th, 1915.

LETTERS, NOTES, ETC.

HYGIENE OF SEAMEN.

COLONEL G. F. ROWCROFT, M.R.C.S., L.R.C.P. (U.P., India) writes: In your note on "Hygiene of Seamen" in the BRITISH MEDICAL JOURNAL for April 9th, just received by me, it is suggested (p. 538) that the rate of mortality for European (not British) seamen is lower than that in land-going industrial life. Possibly so, for to our discredit many foreign ships have infinitely better accommodation for their seamen than most of our British lines (I refer to the Mercantile Marine only), and they therefore lower the percentage of disease, etc. There are a few, very few, praiseworthy English exceptions. Unfortunately, I cannot now refer to figures, but taking British (not European) seamen, in the case of tuberculosis the percentage has been shown to be far higher than for landsmen, due solely to the iniquitous accommodation provided. Incidentally, though it has not to do with this matter exactly, it may be noted that the mortality due to "accidents"—mostly largely preventable, but favoured by the policy of unscrupulous owners—is far higher among British seamen than in any land trade. The suggestion that encroachment on ship space in favour of more room for the accommodation of crews might ruin the industry is countered by the fact that a few British lines do it, as well as some foreign ones, as already mentioned.

HERPES ZOSTER AND VARICELLA.

DR. ARTHUR SOMERS (Selby, Yorks) writes: Owing to the recently established connexion between herpes zoster and varicella the following may be of interest: On May 7th this year I was asked to see a boy aged 2 years. On examination I found that he was suffering from varicella, the eruption being most copious on the trunk and scalp. Before leaving the house the boy's mother informed me that her other boy, aged 9 years, had been sent home from school on April 26th by the school medical officer, who stated in his report that the boy was suffering from shingles. On examination I found a typical eruption on the left side of the thorax. It is, I think, worth observing that in these cases the time between the diagnosis of herpes and that of the appearance of the rash of varicella was eleven days, the incubation period of varicella being generally given as from ten to fifteen days.

NEED FOR POST-GRADUATE INSTRUCTION IN MOUTH SEPSIS.

"A. B. C." writes: "I am dental surgeon to a hospital, and to its attached school. A syllabus has been issued by the school giving a time-table for a special post-graduate vacation course. In this list no mention is made of teaching the evils of mouth sepsis—either its diagnosis, diseases which arise from it, or its treatment. I have had a correspondence about this with the dean of the medical school. Perhaps mouth sepsis, and the results of mouth sepsis, assume an undue importance in my eyes. It may be receiving all the attention it deserves, but this is a question I would like your readers to determine. Personally, I cannot see how a post-graduate course of teaching in medicine can be said to be complete without this subject being carefully and fully dealt with. In the letters to which I have referred my correspondent realizes this subject should be given some attention. The time-table now being complete, it would seem just possible to get an hour's demonstration in on one morning at 9 o'clock. Whilst most of us would agree that this subject deserves some attention, what I really want to know is, Is it important enough to be put in, if necessary, to the exclusion of some of the less-needed teaching which I consider the syllabus allows for? It would be invidious to mention any particular teaching, but there is a long list. For some time past medical literature has been calling attention to the many ailments that can originate from mouth sepsis. Most medical practitioners are fully alive to the importance of this—the commonest of pathological changes in the body. Now the question is, How can he best examine for this in the mouth, how does he set about it, and having established a connexion between it and the trouble he is called upon to treat, what is his next step? He should know to what extent mouth sepsis is remedial—that is, that there are other methods than to take out all the teeth. If I am right in this, is not the dental surgeon the best man to show him?"

*** The nature of the correspondence is sufficiently indicated in the letter printed. "A. B. C." suggested to the Dean that in the light of the influence of mouth sepsis on general ailments some use should be made of the dental department in the post-graduate course. The Dean replied that the difficulty was not to find subjects to talk about, but sufficient time to accommodate all those who wished to take part in the course. "A. B. C." replied that a knowledge of the troubles to which mouth sepsis gives rise is of daily increasing importance to general practitioners, so that the subject deserved a place in any post-graduate course. To this the Dean replied asking "A. B. C." to suggest a time for a demonstration of mouth sepsis in relation to diseases in other parts.

"THE BUFF BOOK."

DR. BASIL E. MOSS (Edmonton) writes: Following on the publication in last week's issue of the BRITISH MEDICAL JOURNAL (SUPPLEMENT, p. 197) of some rather caustic remarks as to the inclusion of the names of various medical men in the "Buff Book" issued by The Business Telephone Directories, Ltd., my attention was drawn to the fact that my own name appeared in this list. I hasten to write to you to point out that I had nothing whatever to do with this. The inclusion of my name in this way was quite without my knowledge or consent (and I have reason to believe that this is the case with several other men whose names appear in the same list). I have written to The Business Telephone Directories, Ltd., protesting against the inclusion of my name in this way, and demanding that it be withdrawn from any further editions of their publication.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 33, 34, 35, 36, 37, 40, and 44 of our advertisement columns, and advertisements as to partnerships, assistantships, and locum tenencies at pages 38, 39, and 40.

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